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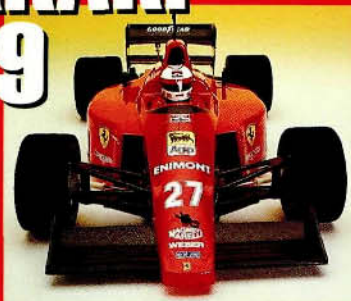
Radio Control

CAR ACTION

THE WORLD'S PREMIER R/C CAR MAGAZINE

November 1990

**FIRST LOOK:
TAMIYA'S
FERRARI
F189**



**INSIDE MASAMI'S
YOKOMO!**

**SECRETS OF THE WORLD
CHAMP REVEALED!**



**OLD ROLLER
USA-1**

**CURTIS STRAWN'S
JG OVAL-WINNING
SRP-1**

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TRAILER—PLANS
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ON THE COVER: Top right: Tom McAdam's home-built trailer carrying the Coca-Cola Dominator. (Photo by Yamil Sued.) Upper right: Joe "Dr. Crusher" Bruni's USA-1. (Photo by Steve Pond.) Center: Masami's World Cup-winning smokin' Yok. (Photo by Yamil Sued.) Bottom: The USA-1 slam-dances its way across the page. (Photos by Steve Pond.) Upper left: Tamiya's all-new 1/10-scale F-1 Ferrari. (Photo by Yamil Sued.)

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ON JUNE 26, 1990, APPLICATION FOR ABC (AUDIT BUREAU OF CIRCULATION) MEMBERSHIP WAS FILED BY R/C CAR ACTION.

EDITORIAL

by STEVE POND

BACK when I first got involved in radio control, the cars were crude, but they were the coolest things I'd seen. I was amazed that I could now effectively control the models I had been building—not just by turning a switch and letting the car go where it might, or by following a car that had a wire connected through its rear bumper. These new cars would actually go where you directed them and accelerate or slow down as you wanted! This was the next best thing to sitting on dad's lap in the old Pontiac and thrashing on the steering wheel while he drove slowly enough to prevent me from doing any harm.

Yep, years of crawling under that old car and 127,342 "what's that?" and "how's that work?" paid off: I'm a maniacal auto buff, and there's no cure in sight. Because my infatuation with auto-

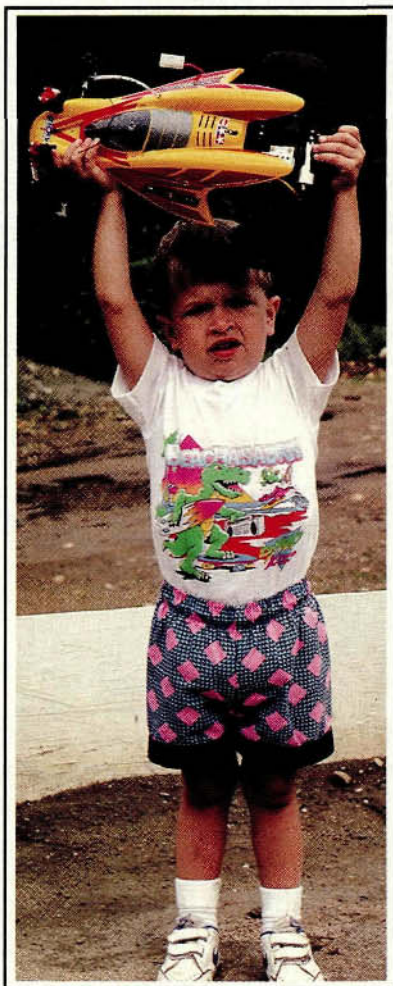


PHOTO BY GOLDEN HOUR LTD.

mobiles came years before my driver's license, and the rides in dad's lap just didn't do it for me, R/C cars were my only option.

As you can see, R/C car racing has stuck with me, and I've learned a lot from the hobby—not just how to charge a battery and install a servo.

What does this have to do with you? Well, the R/C hobby has a lot more to offer than you might think. You'll learn to take the bad with the good (I've certainly lost more races than I've

won!). You'll also come to appreciate the value of practice and persistence, the importance of regular maintenance and myriad other lessons that will stay with you for life.

So, next time you have a bad day at the track and you're ready to boot your car through the up-rights, count to 10 and think of all the good things R/C has to offer! (If you still draw a blank, then boot it!) ■

LETTERS

We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, owing to the tremendous numbers of letters we receive, we cannot respond to every one.

POSTPONE THE GRAPHITE

You have an excellent mag! I look forward to every issue—one month before my friends get it at the store! I have a few questions. Which would be a better investment for my RC10?—a Novak T-4 or a graphite chassis? Is the A&L trailing-arm kit for the RC10 a good choice for an H-arm replacement part?

CHRIS HOLZWART
Olathe, KS

Chris, one of the first hop-ups you should go for is an electronic speed controller.

As well as transferring power to the motor more efficiently and dramatically cleaning up the car's electronic layout, an electronic SC's superior throttle response and braking makes it a far more cost-effective first purchase than an expensive graphite chassis, which makes the car lighter and stiffer. According to our new Assistant Associate Editor John Huber, the A&L trailing arms work pretty well, but they aren't H-arms. The stock suspension arms are closer to what I'd call an "H-arm" than the A&L arms are.

CC

YEAH, YOU SURE GOT US!

I've done it! I've finally done it! I've caught you red-handed! I've been trying

to get the coveted "Eagle Eye Award." Well, I've got you now! On page 21 of the August '90 issue, there are three misprinted "Pit Tips." The detachable antenna, Raider suspension-bolt cure and the double-capacity Clod Buster battery are all printed under the wrong pictures.

By the way, other than that, your magazine rules!

JEREMY FAUST
Oswego, IL

Jeremy, congratulations; you're right! That's it! You're the grand prize winner of the...oh, wait, ah...hold on a minute.... Sorry; the Eagle Eye contest was cancelled eight months ago. You get nothing!

(Continued on page 18)

REEDY Modifieds

Reedy Modifieds Are Bursting Through With New Technology

Reedy Modifieds uses advanced R & D computer systems to develop and improve motor performance. Race developed and tested, Reedy motors are 4 TIMES IFMAR WORLD CHAMPIONS, leaping ahead of all competition.

**Reedy Modifieds.
The Outburst of
New Technology.**

CURRENT

TORQUE

POWER OUTPUT

OVERALL EFFICIENCY

(Graph shown represents actual core readout of Reedy Modifieds motor.)



INSIDE SCOOP



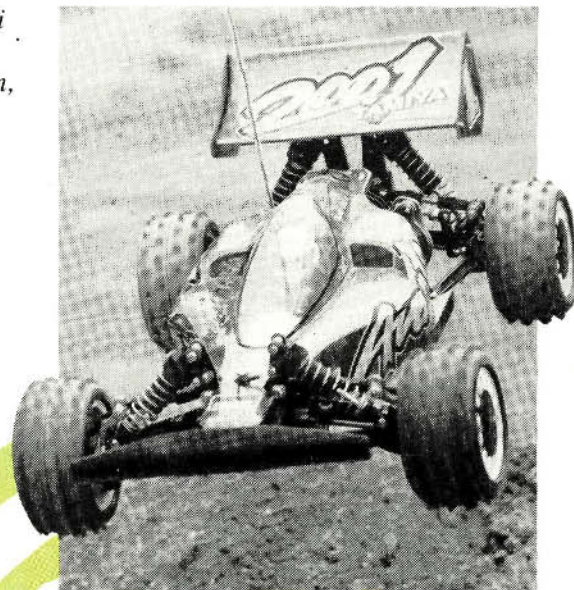
by CHRIS CHIANELLI

As directed by the Ayatollah of Radio Controlla, Commander Crash Chianelli reporting back to the faithful followers of the Grand High Exalted with pertinent information! I'm back from my latest espionage excursion with microfilm, spy shots and stolen communiques that read as follows:



TRAXXAS MAKES ITS MARK

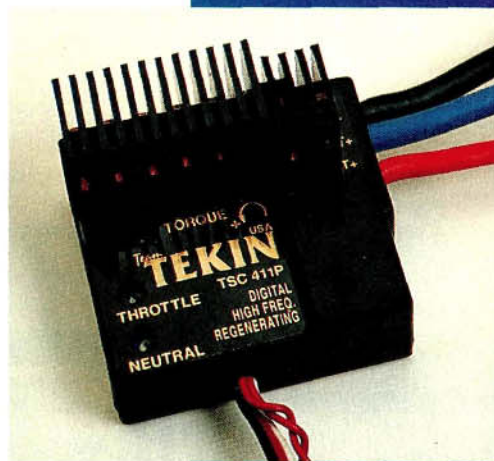
Two new names in racing—Tom Owens and Traxxas—took the Open Truck Class at the NORRCA National Championships in Dallas, TX, driving a B&R-powered TRX-T Eagle. This graphite-chassis truck, which was designed from the ground up as an off-road racer, was the only Traxxas TRX-T Eagle in a field of JR-XTs and RC10 conversions. The truck had many features that made me take notice as soon as I laid eyes on it. I'll bring you a full report on it soon, revealing all its hot design features. I told you to keep an eye on this company!



OFF-ROAD ODYSSEY

The expensively misguided Avante effort may be salvaged (in a sense!) with the re-engineered—substantially cheaper—2001, which borrows much from the original Avante's design. It's much more affordable than its predecessor, yet it manages to retain such features as oil-filled coil-overs and front and rear planetary diffs with a center ball diff.

**ON YOUR MARK...
GET SET...
CHARGE!**



Charging circuitry is what the new Tekin high-frequency TSC411P and TSC410S have. When an R/C car's electric motor is mechanically turned, its momentum, in the off-throttle position, makes it act like a mini generator. These new Tekin controllers have what's called "regenerative battery recharging circuitry" to put the current generated by the motor back into the Ni-Cd. I'm told that 12 to 40 seconds may be added to a given run time.

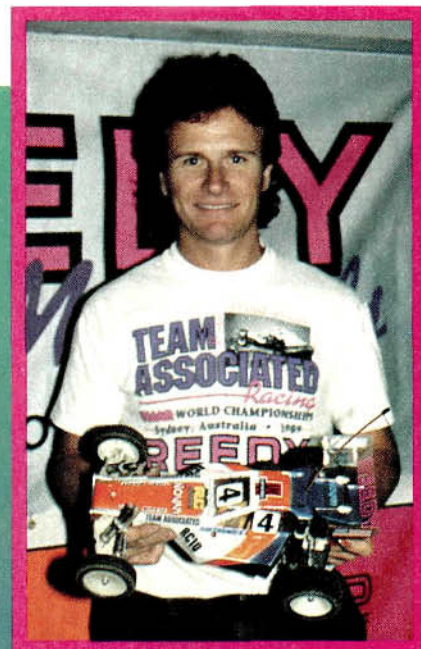


...LOSI'S LOADED!

By the time you read this, Losi will (we hope) have released a "fully loaded" version of the JR-X2. This car will have all the features found in the optional Proformance kit, plus lots of other great hop-up parts that have never been available before. The car will be called the JRX-Pro. More to come...!

TAMIYA TOYOTA

It seems that Tamiya is expanding its racing truck line—a wise move!—to include a Toyota Hilux body. The quad-groove front tires (good for loose stuff) are also new for Tamiya. Details for licensing with a full-scale racing team are being worked out. How much, if at all, the undercarriage differs from that of the King Cab remains to be seen.



CLIFF LETTS LOOSE

OK, simply put: Cliff Lett, his YZ-10 and his RC10 Aluminum—not graphite-trend followers—swept the ROAR Off-Road Nats. A full report by Mad Mike Lee will appear soon.

MONSTER RUBBER

Racing truck tires are on the way from Trinity. The new Baja Series racing tires are of natural rubber and will be available in the 2.2-inch configuration that's popular with Trinity's off-road tires and wheels. The 2.2-inch truck rims will also be available. Ribbed fronts, standard spikes, cut spikes and mini spikes will spearhead the new line.

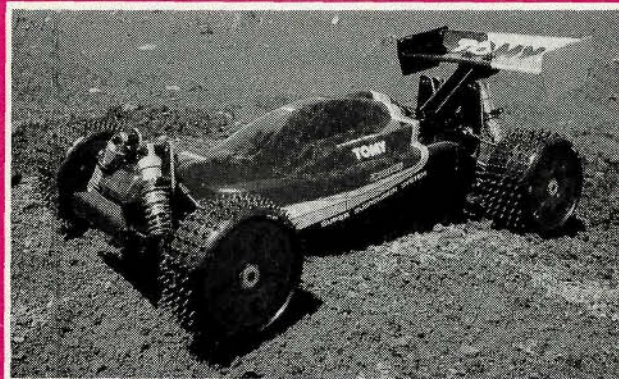


— MOVE OVER YOKOMO! **TOMY IS HERE**

That's right! The manufacturer of doll houses and ride-on plastic caterpillars seems to be involved in an extremely high-tech, all-out, 4WD, off-road racer. The Tomy 1/10-scale EP#7 has front and rear



lower A-arms with upper links, a center diff, a belt drive, oil-filled coil-overs, a magnesium motor mount, a rear sway bar and full ball bearings and is available—in Japan!—right now!



Compromise No More

MAXIMUM DYNAMIC RANGE

Astro's New Model 205 Hi-Rate Electronic Speed Control has the largest dynamic range available anywhere. It works with 6 cells to 32 cells...efficiently. It works with 50 Watt Ferrite 05 motors and 2000 Watt Cobalt 60 FAI motors.

100 AMPS PULLING POWER

Five IRF-Z40 MOSFETS, a special gate drive circuit, and a Built in Aluminum heat sink give the 205 a peak (1ms) rating of 700 Amps and a 30 second rating of 100 Amps. Power enough to handle twin 40 motors sucking 100 amps during monster truck pulls.

100 AMPS BRAKING POWER

Four IRF-Z30 MOSFETS in the brake circuit have a peak rating of 500 Amps and a 5 second rating of 100 Amps. Powerful enough to stop an 80 mph dragster or a 400 lb sled. And the regenerative braking circuit pumps amps back into your nicads during braking.

OPTO-COUPLING

Opto-coupling eliminates any direct connection between the radio circuit and the motor circuit.

direct connection between circuit.

Motor noise can't get into your radio receiver and cause glitching.

HI-FREQUENCY SWITCHING

Hi-Frequency switching is much more efficient than frame rate switching,

especially at lower throttle settings. Motor heating is greatly reduced, motor runs noticeably longer, and throttle response is extremely lively.

SIGNAL FILTERING

A special triple pole low pass filter in the decoder circuit produces a SOFT START and a very smooth and precise speed command. Try it once and you will never want to return to the spastic control you live with now.

16 AMP SHOTKY DIODE

This massive flyback diode greatly reduces switching losses during partial throttle operation. The control runs much cooler and more efficiently and your nicads run longer.

NO MORE COMPROMISES

I designed the Astro Model 205 Hi-Rate Speed Control with

No Compromises. I gave it all the features that serious electric competitors have been asking for. I hope you like it.

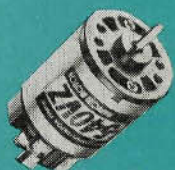
Bob Boucher
Bob Boucher



AstroFlight INC.

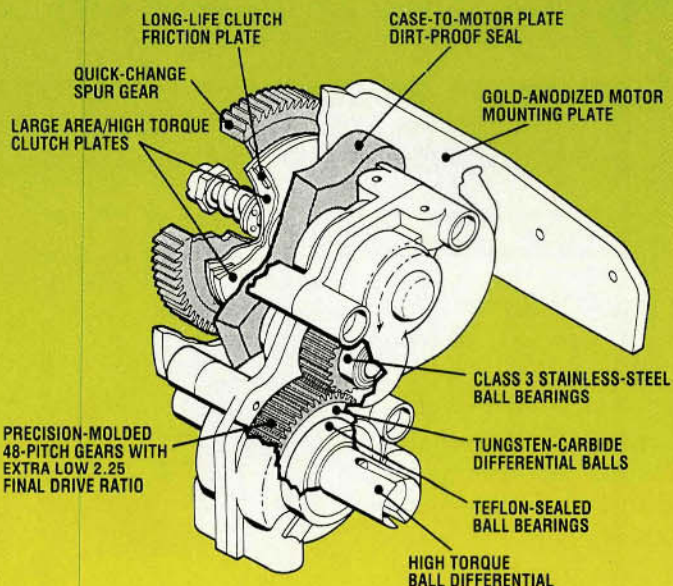


PATENT-APPLIED-FOR CUT-CORE MOTOR



According to overseas sources, these new-technology motors—the RX-540VS and the RX-450VZ—claim more than 3000 grams of torque per centimeter for quick throttle response, and they have excellent top-end rpm. I'll be bringing you more on the Cut Cores.

STEALTH CUTAWAY



Here's a first look at the new Associated Stealth Transmission whose prototype appeared at the Worlds. In Chris Lett's RC10, the first production version took 2WD Modified at the ROAR Off-Road Nats. The new tranny features ATC (Associated Torque Control) with an adjustable-clutch friction plate behind the spur gear.

I'll see you next time—or sooner, if I catch you in my spyglass!

CC

POWER MONSTER

Power is the only thing Monster trucks understand. And Team Astro speaks their language. Ten super power cobalt magnets, a skewed seven slot nature, twelve turns of 22 gauge wire, an oversize commutator, oversize brushes, and adjustable timing.

They all spell FULL PULL POWER.

CORDS ARE FALLING

Team Astro Pullmaster motors are powering monster trucks to new records at NARCTPA truck meets all over the midwest. The reasons are many but they all boil down to one thing...the Team Astro Pullmaster Cobalt Motor delivers a full pull every time.



NO NEED TO BE LEFT BEHIND

See your favorite hobby dealer TODAY and ask for the Team Astro Pullmaster Cobalt motor.

♦ ♦ ♦ ♦ ♦ FLASH! ♦ ♦ ♦ ♦ ♦

World Records at NR/CTPA World Championships

On October 14th & 15th
TWO WORLD RECORDS were set
using Team Astro PULLMASTER motors

2WD Open I: 203 lbs.
1ST PLACE: Charles Allen

2WD Open II 350 lbs.
1ST PLACE: Gary Kmit -



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READERS' RIDES

Welcome to Readers' Rides. This is our way of giving recognition to the unique, innovative—and sometimes bizarre—vehicles that our readers have created. If you want to join the growing ranks of Readers' Rides winners, send us a sharp, uncluttered, well-exposed color photo (no Polaroids, please!) of your car or truck, along with a brief description. Who knows? The Ayatollah of Radio Controlla might pick your car.

If your ride is chosen, you'll receive a one-year subscription to *Car Action*, or we'll extend your existing one. You'll also be eligible for the second annual "Readers' Ride Car of the Year Contest" in the fall of 1990. Send your photos to Readers' Rides, *R/C Car Action Magazine*, 251 Danbury Rd., Wilton, CT 06897. Be sure to include your address and phone number, in case we need to contact you!



"SHOCKING" EXPOSURE

Ed Strezelecki of Smiths Creek, MI, is in love with shock absorbers; in fact, his Blackfoot has *seven* pairs of them! With three pairs of shocks on the front, and four pairs on the back, there's no way in the world that this trick truck will bottom out—even with a sumo wrestler on top!

BAD BOY'S BUSTER

Bob "Bad Boy" Silva really went to town on his clean and shiny machine, which started out as a Clod Buster. Ready for this? Bob's Clod has a hand-built tilt hood, a Corvette 350CI engine (borrowed from an un-named static kit), hand-built gull-wing doors, a rearview mirror, bucket seats, a custom dash, cloth seats and carpet, an aluminum firewall, custom-made aluminum skid plates, a louvered sunroof, stainless-steel bed rails and bumper brackets, a metallic bed cover, a working winch—and that's about *half* of Bob's mods; we don't have enough room to list the rest! This "Bad Boy" definitely went bonkers!



WILD WAVE ACTION

This wild looking Blackfoot is the work of Chad Hardy of Decatur, IL. With a chromed chassis, a Wimpy motor, a Novak ESC and a Futaba Magnum radio to control it all, Chad has a *mean machine*! Knowing that anyone can add this stuff to get a neat Blackfoot, Chad also installed a body that sets it apart—the wild-wave job on it has won several awards! Now it can add "Readers' Rides" to its win list.



JUST DON'T SPRING A LEAK...

Devin Krawchuk of Drayton Valley, Alberta, Canada is the proud creator of this Clod Buster named Oil Strike. This truck's highly detailed scale body is a Pro-Line Chevy with some mods to make it look "real" (e.g., the flag and the paint job). Being from an oil-rich country, we're sure that Devin could strike it rich with this "black gold!"



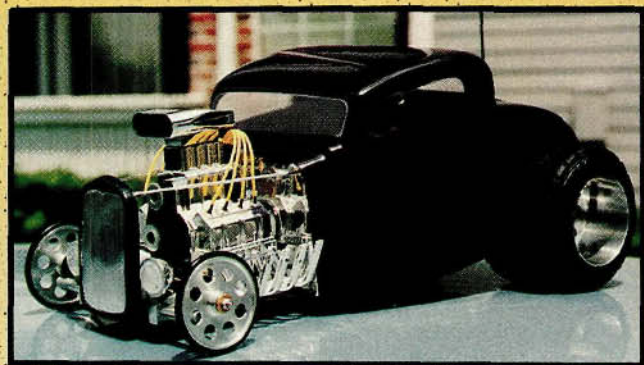
SLICK SPRINTER

Bob Mercier is a new kid on the block, and he has a lean-and-mean driving machine! Bob added a set of Andy's A-arms, a Novak T-1X, Custom Scale Universals, and a McAllister lowering kit to the basic RC10/Big Boys Toys conversion kit. Special thanks go to Hal Empy, who was instrumental in creating this beautiful car!



THE DARK KNIGHT

If Batman could race NASCAR, this is what his car would look like! This rare, daylight photo was taken by Bob Collins of Cincinnati, OH. With inspiration from the movie, Bob laid on the really cool paint job. This new-age Batmobile is based on a Ford Thunderbird body and has a sleek, rear wing that looks like a bat! (Pun very much intended.)



OLD FORDS NEVER DIE!

Hot Rods are back with a vengeance and no one is happier than Steve Young of San Antonio, TX! Using an Advanced Engineering chassis as the base, Steve added a set of tires, and Advanced milled-aluminum rims, a Trinity Sprint motor and a McAllister '34 Ford Coupe body. Then came the customizing: a narrowed rear end, dropped front end (for the weedeater look), a detailed and chromed engine and firewall, a custom-carved front grill and chrome grill-support rods. Steve's final touch was the licence plate, "NVMY34" ("envy my '34"). I'm sure that everyone who sees this car is green with envy!

BUICK POWER

Rock Allen of Pana, IL, thought that an old Bolink Invader might make a good "run-around" car. With the Invader kit in hand, Rock chose a Futaba Magnum Jr. with a MC112B speed controller to supply and receive his commands. With all the mechanicals in place, Rock painted the body, and here's the result. Good job, Rock!





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LETTERS

(Continued from page 8)

ing, but we admit you spotted our boo-boo. We take a billion lashes with a wet noodle—OK?

CC

BITTEN BY THE 1/4 BUG

I read Steve Pond's article on the King 8 Supnationals in the February issue and was simply amazed at the details on the cars. I want to buy a 1/4-scale car, and I'd like some of their manufacturers' addresses. Also, what type of Grand National car is no. 25, sponsored by Folgers (page 78), and who makes it?

JOHN McCORMACK
Dunnville, Ontario, Canada

A number of 1/4-scale manufacturers are listed in our "1990 Buyers' Guide," which is available through our magazine. The no. 25 Folgers car is manufactured by WCM (Winner's Circle Manufacturing), but it isn't actually sponsored by Folgers; its owner simply chose to use that logo.

SP

CONSIDER THESE COMMENTS BEFORE YOU BUY!

I've never written a letter to a magazine before, but the action of two companies has prompted me to write a letter giving the highest praise.

I sent away for an RC10 truck conversion from Andy's. The body was painted candy-apple red and looked great, but the polycarbonate had a bunch of scratches in it, and they dulled the finish. I told Andy's about the problem, and they said they'd paint a new one to my specs and send it back right away. To my surprise, I received a new, perfectly painted body in less than a week—at no charge. Thank you, Andy's!

I also bought a 1/12-scale Bolink truck body through the mail, and it was all distorted. I gave Bolink a call to explain my problem, and in less than a week, I had a new one—again, at no charge! These two companies deserve a lot of praise.

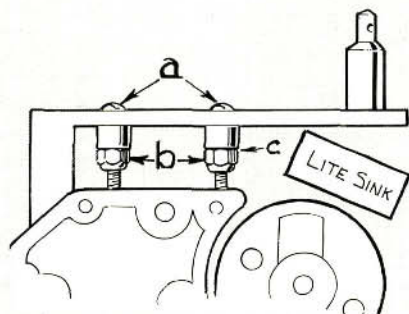
ROBERT RAUPP
Adrian, MI

I'm writing to tell you about a good experience I had with a topnotch company. I recently burned-out a transistor in my

(Continued on page 20)

PIT TIPS

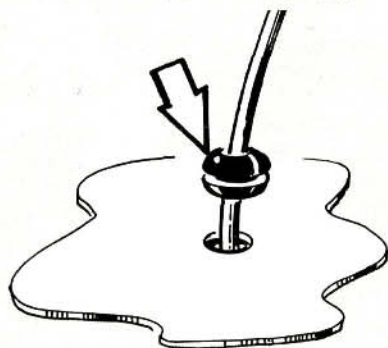
by JIM NEWMAN



RC10 BODY-MOUNT MODIFICATIONS

Zac put a Litespeed heat sink into his car, but when he tried to install an Andy's rear body mount, he found that it interfered with the heat sink. His solution was to install some 3/4-inch-long screws (A) in the body mount, holding them captive with self-locking nuts (B). Note the little gap (C) that allows the screws to turn freely in the mount.

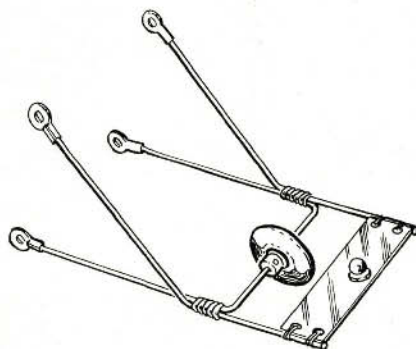
Zac Meltzer, Winnipeg, Manitoba, Canada



RUBBER ANTENNA GROMMET

After a new body has been painted, an antenna hole can crack if it's left unfinished. The remedy?—buy some rubber grommets from Radio Shack, and slip one into a hole before you insert the antenna. (A smear of dishwashing soap on the grommet helps to get it into the hole.)

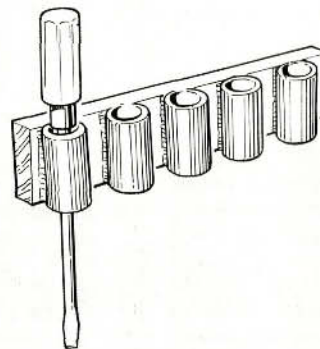
Ted Scholten, Lethbridge, Alberta, Canada



BIG BEAR WHEELIE BAR/HITCH

This useful device is made of 1/8-inch-diameter wire that's wrapped with brass wire and soldered to it. Use a 1- to 1 1/2-inch-diameter airplane wheel and center it with wheel collars. The brass hitch plate is also bound and soldered. Install a Kyosho ball joint as shown.

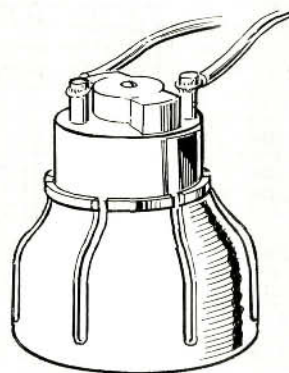
Jay Montgomery, Manly, IA



SIMPLE TOOL RACK

This very simple tool rack is made of old garden-hose sections that have been "hot-glued" to a piece of wood. Make it to any length, and nail it to the wall, or to a handy beam.

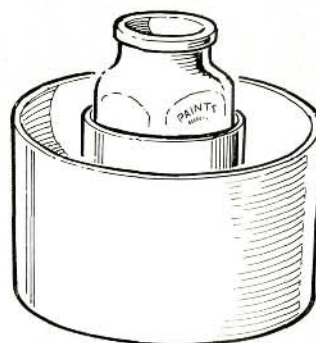
Cindy & Andy Brown, Garden Grove, CA



MOTOR-HOLDING JIG

Here's a useful item that can be found in almost any hardware store: a child-proof doorknob. Hot-glued to the end of the bench or to a piece of wood, it holds a motor while you solder the wires into place.

Mike Benton, Waukegan, IL



ANTI-SPILL BOTTLE HOLDER

Do you want to keep your paint bottle and even CA bottles upright while you work? Remove the top of a large spray can, and put the bottle into the top's inner well. If the cap is made of polyethylene, the outer well will also hold some brush wash or thinners.

Brian Worrell, San Jose, CA

(Continued on page 22)

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Westminster, CO 80030

CAR KITS

RC10 Std w/bearings	\$129
RC10 Std w/bearings	169
RC10 Graphite w/bearings	189
JRX2 Std w/bearings	169
JRXT Truck	219
Ultima Pro w/bearings	189
Optima Mid SE	229
Raider Std	89
Raider ARR or Turbo	109
Big Brute Truck	99
Big Boss Truck	119
Double Dare 4WD Truck	159
Blackfoot Truck	109
Mid Pumpkin Truck	109
King Cab Truck	189
Clod Buster 4WD Truck	269
RC10L Fiberglass	109
RC10L Graphite	149
RC12L Fiberglass	69
RC12L Graphite	129
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Protech 702	15
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LETTERS

(Continued from page 18)

Novak speed controller, and I sent it to the company, explaining my problem. Within two weeks, the Novak was back in my car, and I missed only one week of racing. A special thanks to Novak and to Car Action for being there to help.

JEFF POLLARD

Tolland, CT

IF IT RUNS WELL, DON'T FIX IT!

I've been racing cars for three years and have a Traxxas Radicator that runs well. Are there any high-performance transmissions for it? Can you fit the RC10 spur gear on the Radicator? Can you interchange the RC10 steering blocks and A-arms with the Radicator's?

JOHN CHAPPLE

Ardmore, PA

John, the steering block and A-arms on the Radicator are fine, so leave them alone. Traxxas produces 48-pitch gears (including a spur gear) and an externally adjustable ball-diff for the Radicator. The addition of these two should give you the results you're looking for.

CC

DUAL SERVO DILEMMA

Can you splice servo wires so that you can use two servos on the same channel (e.g., Clod Buster steering)? How do you break-in a motor economically? I tried to connect two batteries in parallel, but the speed controller burned up. What caused this? How can I fix it?

ERIC ALVARADO

Goshen, NY

Eric, to operate two servos on the same channel, you should either splice the three wires in parallel or pick up a suitable Y-connector for the radio you own. To splice, make sure you connect all the wires of the same color together: red to red, black to black and white to white.

To break-in the motor, try using the

MCS brush cutter, which allows you to pre-seat the brush before you run the motor. As for the two packs in parallel, there shouldn't be a problem. In parallel, two packs act like one with a larger capacity. If you hook them up in series, however, the voltage will double and be too much for most speed controllers to handle. Send the unit back to the manufacturer for repair.

JH



COBALT OR NOT COBALT

I own a Lynx II with a Tekin 700 ESC. I love to run 12 to 14 cells in it, but my motors have a hard time keeping up. How would one of the Astro Flight cobalt motors hold out? I also like to race at a paved on-road track. How would the Astro motor perform with 6 cells instead of the recommended 8 to 14 cells?

LORNE SERPA

Fresno, CA

Lorne, it sounds to me as if you're drag racing. Using that number of cells, you're putting a lot of voltage into a motor that wasn't designed for so much. For drag racing, the Astro drag motor would be a good choice. It's a bad idea to run 6 cells in this motor on a roadcourse. For the best results, you should have a motor for each application.

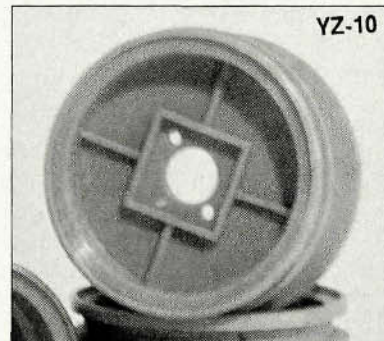
JH

IS LONGER BETTER?

Does anyone make long shocks that I could mount on the front of my Ultima? And what's the purpose of longer shocks? A friend of mine has a Tyco car that runs on a 9.6V-battery. Will my Astro Flight

JG'S BOLT-ON ADVANTAGE

YZ-10



DIRECT BOLT-ON MONSTER TRUCK RIMS

These "new" dyeable nylon rims are ultra light for less unsprung weight. Front rims use stock bearings and axle nuts, rear rims use stock axle nuts. Front and rear rims are ribbed across the back for super strength.

1453 RC10 Front Nylon Direct Bolt-on Rims.
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practices

A lot of the motors I've tried would be better as fish sinkers than motors, and many of the ones recommended by fellow R/Cers don't work for me. (I can sometimes go faster with what they only practice with.)

I spend a lot of time keeping my motors clean and with fresh brushes, and I always use a dust cover in poor conditions. I run a Tekin ESC, and, as much as possible, I keep the car's drive train from binding. Who can I talk to about my problem?

ROB SCHUMACHER

Madison, WI

Rob, the information you want is only relevant with modified motors, because—ideally—stock motors should be equal in all respects. Stock winds run hot and don't last because manufacturers have been cranking the commutator timing out of control. Many racers over-gear in an attempt to go faster, and that also contributes to early motor failure. ROAR is attempting to address this by imposing a timing limit, and Trinity now offers the Hammer Time stock motor that really seems to be tamper-proof: its timing can't be cranked, and it has a built-in, sane amount of timing that won't cause excessive heat and early motor "retirement." More efforts like these will be welcomed.

CC

WHERE TO WRITE TO US

If you're writing to us (and we'd love to hear from you), please be sure to address your letters to "Letters," Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to us in Connecticut, and this leads to long delays.

4005B charger work with these packs?

EDWARD ENG

Long Island City, NY

Edward, as far as the long shocks for the Ultima are concerned, JG Mfg. has long shock towers in graphite and in fiberglass. The longer shocks increase suspension travel and damping, but this combination doesn't work well on all types of track. It's overkill if the chassis bottoms-out before the shocks do, so try to avoid this. The Tyco battery you mentioned is a pack of eight 550mAh batteries. Although it can be done, it isn't a good idea to fast-charge cells this small. They weren't designed to take the current most chargers are capable of delivering. Your pack will last much longer if you trickle-charge it on the charger it came with.

JH

HOT WINDS

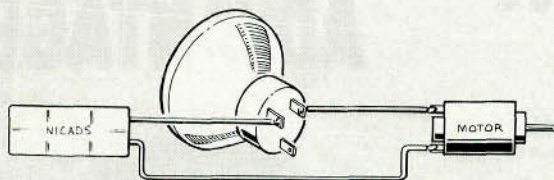
Why do stock armatures burn up? Why don't manufacturers of stock motors take measures to make them last longer? Some of my motors have lasted nine months; others lasted only three or four runs. I've found some really good, reliable, consistent, stock motors, but to find good ones, you usually have to pay for three or four bad ones in between.

I feel as if I'm being ripped off by some of these companies. Most manufacturers don't give any real, usable technical data about these motors to purchasers. Info on the number of windings and the wire's gauge is only marginally usable; a discussion of endbell design doesn't mean much; magnets are really beyond my control; and bushings are bushings—bearings are better.

How about giving information like this?:

- the brand/compound of brushes and springs for direct replacement
- recommended max voltage and gear ratio
- recommended lubricants
- recommended break-in and re-break-in

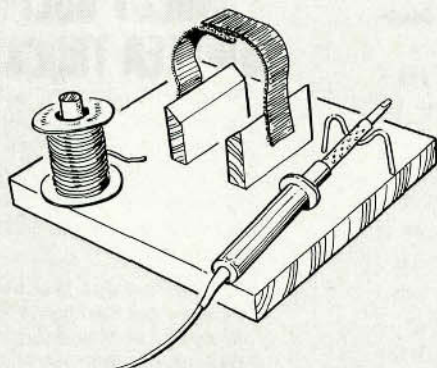
PIT TIPS



BREAKING-IN HIGH-POWERED MOTORS

Mitch says that no. 1156 bulbs only work on 540 motors, because they won't pass enough current to allow high-power motors even to turn over. A no. 6006 sealed-beam, 6V headlight is very reliable and costs about \$5. Solder the wires straight to the two upper tabs, as shown, and you'll find that your motor runs at about the same speed as it would on two D cells.

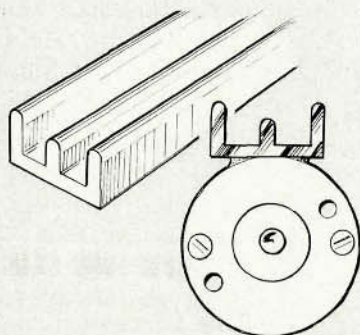
Mitch Poling, Wiesbaden-Biebrich, West Germany



MOTOR SOLDERING JIG

This simple wooden jig not only holds the motor between the blocks with Velcro while you're soldering, but it also holds the solder on a dowel spindle, and it has a simple wire rest for the iron. Drill holes in the wood so that the dowel and the wire rest can be glued into place. The device shown here measures 9x9 inches, and the spindle was made of a 1/2-inch dowel.

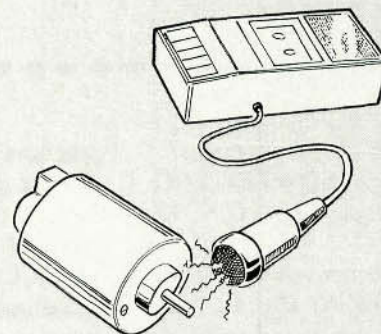
Chris Cluff, Prospect, OH



HOMEMADE HEAT SINK

Geoff found that the aluminum upper guides used on sliding doors make a fine heat sink when cut to length and glued to this Trinity motor. He used CA to glue the rail to the motor case, but aluminum-filled epoxy might work better. You could also try curving the base of the sink so that it provides more contact with the motor case. Two or three sinks would get rid of the heat more efficiently than just one.

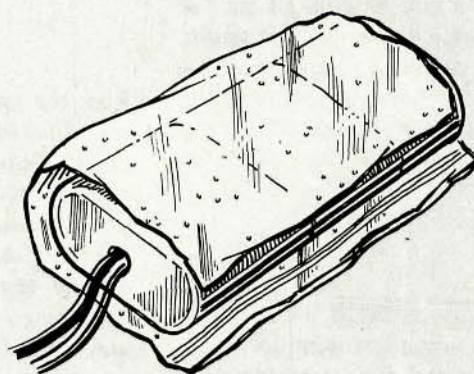
Geoffrey Aguila, Quezon City, Philippines



MOTOR TUNING BY SOUND

When your motor is in tiptop condition, record its sound at peak rpm. After you've changed the brushes and serviced the motor, record the sound again, then compare the pitch of the two recordings. Jim says you'll quickly learn to detect any deterioration or improvement in performance, just by the pitch. Don't forget to save the recording of the motor when it's in first-rate condition.

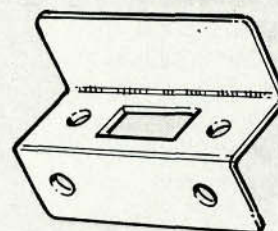
Jim Aerno, Denver, CO



BATTERY COOLING

Here's another way to cool your Ni-Cd pack after a race. Fill a self-locking plastic bag with ice water, then wrap the bag around the battery pack. Our contributor says you only need to have the bag one-quarter full. Be sure to squeeze out all the air.

Yali Friedman, Willowdale, Ontario, Canada



BLACKFOOT SWITCH BRACKET

This brass sheet bracket replaces a broken BEC switch bracket. You can find inexpensive .032-inch brass sheet in the K&S Metal Center of your hobby shop. Cut the metal to size, bend it over a hardwood block, then drill, cut and file the holes to fit the switch. Note that the switch guard is raised up on one side.

Henry Banuelos, Lakewood, CA

PUBLISHER'S PAGE

by LOUIS DeFRANCESCO, JR.

THERE'S A strong underlying concern in the industry about bringing "new blood" into the R/C hobby. This was a key topic during my recent meetings with industry notables, including Roy Gelbar, president of MRC; Ken Macdowell, president of Parma International; Alan Greene, vice president of Hobbyco; Patricia Takeda, marketing director of Sanyo; Ernie Provetti, president of Trinity and others.

The industry is strong, but a collective effort is needed to ensure its future growth. No more deliberation! We sorely need more programs like the Speedworks Series, in which kids' driving skills, rather than their wallets, are challenged! MRC Vice President Andy Iatti informed me that his company will introduce a new, nationwide program similar to its "Run For Fun" series of a few years ago. This is a fantastic concept, and *Car Action* might even be involved!

There are individuals in this industry who think high-end racing is what it's all about. This type of competition is exciting, but the exorbitant costs involved force out youngsters on a budget—our future! They go home discouraged and are unlikely to return. High-end racing has its place: it results in new products and better technology—racetracks are, in essence, testing grounds—but let's keep it in perspective.

During the mid '60s, I was active in slot-car racing, but by around 1967, it was futile for me to go to the track, because I just didn't have the financial resources to be competitive. The local hotshots blew my doors off with their epoxy-dip hot-wind motors, brass-tube chassis, cheater front wheels, double-barrel half-ohm controllers and all that other great "trick" stuff I couldn't afford! So why go? Slot racing had other inherent problems that caused its popularity to wane, but there's a lesson to be learned: if you discourage youngsters on a budget, you kill the hobby's viability.

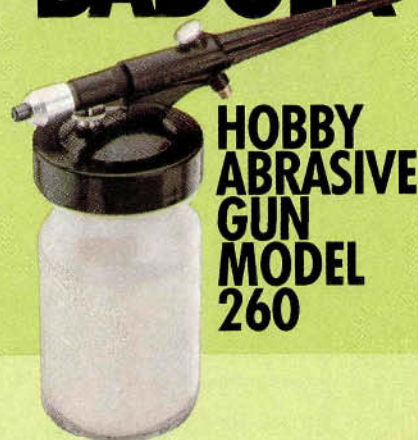
The "Home-Built Project" in this issue is proof of the great imagination that's so prevalent in our hobby, and Thomas McAdam (of Pensacola, FL) typifies the creative R/Cer who designs his own vehicle and adds a little ingenuity. Tom's aero trailer is a really neat project that's fabricated from balsa wood and easy to build. Tom even gave us a great drawing and dimensions to share with his fellow R/Cers. If you want a terrific trailer to tow your favorite car around, this is the ticket!

As the hobby evolves, we see more and more custom projects like this. Soon, we'll feature a wild R/C vehicle that needs *seven* channels to operate! This hobby has so many facets—besides racing—that can be challenging and rewarding, and Tom's trailer is testament to this. What's the 7-channel vehicle? You'll have to keep reading *Car Action* to find out!



Publisher Louis DeFrancesco goes over some *Car Action* layouts with senior Art Director Alan Palermo. Alan is responsible for much of the magazine's creative direction. All graphics are computer-generated on the Macintosh system.

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The Badger Hobby Abrasive gun is the perfect tool for the do-it-yourselfer and the hobbyist. This abrasive gun can make most refinishing projects quicker and easier. With the Hobby Abrasive Gun, you can etch designs or cut monograms on both wood and glass. An ideal tool for prepping metal surfaces, jewelry refurbishing and much more. Curved or hard to reach areas can be cleaned with ease.

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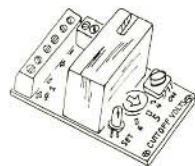
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DIRT-OVAL NATS WINNER



CURTIS STRAWN

won his *fourth straight* JG Oval Championship in this Superior Racing Products* SRP-1! It also swept top qualifier honors in the 4W Open, the TQ Run and the Trophy Dash, and Curtis broke his existing track record (at Racer's Haven, Bakersfield, CA) by two laps! This car was clearly the fastest of the field.

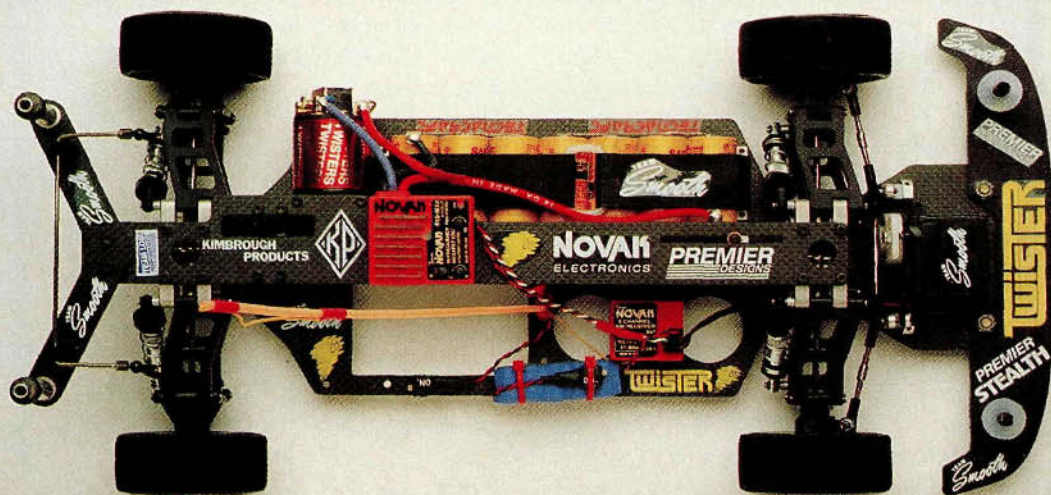
What makes the car so deadly in the hands of a driver like Curtis? It isn't that much different from a Stock SRP-1, but it's very meticulously detailed. Curtis retained the Stock SRP-1 graphite chassis

from Kinetic Composites*, a company that produces a superior grade of graphite. He has tried every brand of graphite and has broken quite a few chassis in competition, but not one Kinetic Composites chassis shows any sign of structural weakness. All SRP-1s are now shipped with chassis made of this material.

To reduce the weight slightly, Curtis machined out much of the chassis' right side as well as the motor-mounting plate and the jackshaft. Titanium axles, dogbones and outdrive cups were also used to

reduce the rotating mass. He used Tecnacraft* turnbuckles because they were stronger, easy to adjust and lightweight. To avoid binding, the car's front-end spindles were carefully machined. A small 1/16-inch hole was drilled in the aluminum steering-linkage blocks so that oil could be applied—Curtis says that this is a *must* for the smoothest operation.

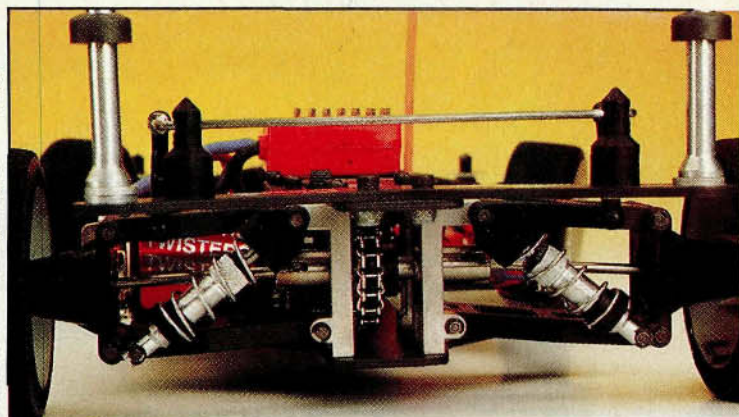
To ensure clearance for the TRC* rubber-capped tires that were on Yokomo* rims, the front Kydex bumper was cut out. To improve aerodynamics, the wheels were



This photo of the chassis shows how much was cut from the right side. Note the large bumper and hefty bar. The small battery on the right side powers the receiver.



The batteries are held in place with Velcro. The power that flows from the 7-cell pack only goes a short way to the motor—through the Novak speed controller.



The TRC shocks are the same as those used on the Lynx II. The heavy-duty roll bar keeps the rear end stable through fast turns. To reduce weight, the dogbones and the drive cups are made of titanium.

covered with black Paragon* aerodiscs. No stagger was used on the car, i.e., all the tires had the same diameter.

Curtis used a small Novak* NER-2X receiver, the new Novak 410 MXc speed controller and an Airtronics* servo. The power starts with the Team Smooth* punched Sanyo* 1700s and ends with the Twister* "Fast Eddie's Ride" motor.

To provide better corner handling with less severe roll point (and even tire wear), the car's suspension setup has upper and lower arms of unequal lengths (the upper one is shorter). SPR-1 suspension arms are made of

specially heat-treated, stress-relieved magnesium, which is a very lightweight, strong material. Curtis, however, used machined Celcon arms, which are also heat-treated and very strong. He used TRC shocks, and 40WT Team Losi* shock oil. The suspension pins are heat-treated steel—they don't bend!

A large Kimbrough* servo saver (see photos) was used for an increased mechanical advantage, although a special small hole had to be cut in the chassis plate to clear it. Kimbrough gears were used in the drive train.

Topping it all off is a brand-new body design

from Premier*—the Stealth Wedge. It features an aerodynamic cockpit and a flattened front-end profile.

Curtis's race car proves that little things make a big difference in a car's performance. Meticulous detailing and hard work contributed to his win. Congratulations, Curtis!

**Here are the addresses of the manufacturers mentioned in this article:*

Superior Racing Products, P.O.
Box 25913, Santa Ana, CA 92799.

Kinetic Composites, 512 W. California,
#204, Vista, CA 92083.

Tecnacraft, 1335B Dayton St.,
Salinas, CA 93901.

TRC, P.O. Box 1058, 2211 Charter
St., Albemarle, NC 28002.

Yokomo/Associated Electronics, 3585
Cadillac Ave., Costa Mesa, CA 92626.

Paragon Racing Products, 690
Industrial Circle South, Shakopee,
MN 55379.

Novak Electronics, Inc., 128-C
East Dyer Rd., Santa Ana, CA 92707.

Airtronics Inc., 11 Autry, Irvine,
CA 92718.

Team Smooth, 311
S.W. 79th Terrace,
North Lauderdale,
FL 33068.

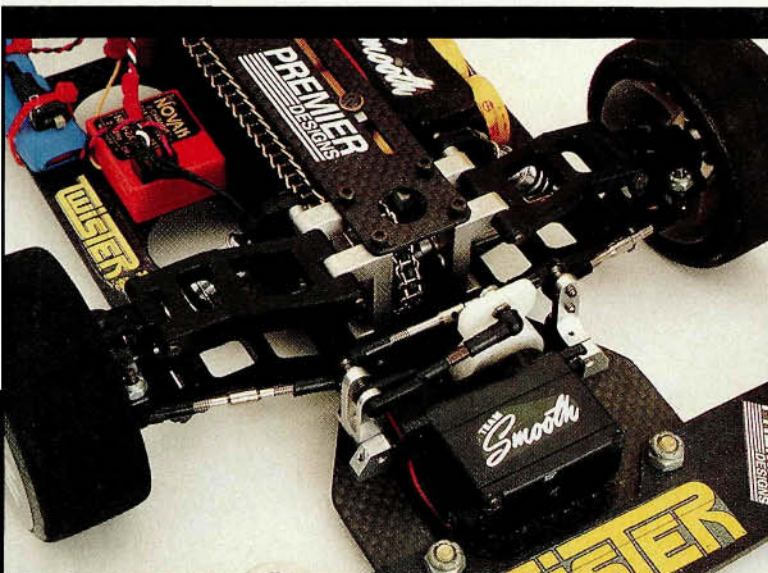
Sanyo Electric, 200
Riser Road, Little
Ferry, NJ 07643.

Twister Motors, 657
E. Arrow Hwy., Ste.
H, Glendora, CA 91740.

Team Losi, 1655 E.
Mission Blvd., Po-
mona, CA 91766.

**Kimbrough Prod-
ucts, 1420 East St.**
Andrews Pl., Unit F,
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Rear Track 7.75 inches

WEIGHT:

Gross (w/battery) 55.67 ounces

BODY:

Type Stealth Wedge
Material Polycarbonate

CHASSIS

Type Pan
Material Graphite

DRIVE TRAIN:

Primary Gear
Transmission Chain drive
Differential None
Bearings/Bushings Ball bearings

SUSPENSION:

Type (l/r) Upper and lower A-arms of
unequal-length
Damping (l/r) TRC oil-filled shocks

WHEELS:

Type (l/r) One-piece nylon
Dimensions (DxW) (l/r) 2x1 inches

TIRES:

Front/Rear TRC radials

ELECTRICS:

Motor Twister "Fast Eddie's Ride"
Battery Team Smooth
Punched 1700 SCE
Speed Controller Novak 410MXc

THERE'S ONLY ONE WORD to describe a full-scale monster-truck championship—*outrageous!* These colossal mega trucks are more than four stories high, loaded with chrome-plated accessories and painted in far-out colors. But what really makes your hair stand on end is the earth-shattering thunder their monster motors generate during an exciting car-crushing race!

K Y O S H O

USA-1

by JOE BRUNI



PHOTOS BY STEVE POND

USA-1



popular monster truck on the national circuit, and now you can own an uncanny, 1/10-scale clone!

KILLER KIT

The USA-1 R/C model has many

more than 11 inches high and almost 18 inches long, and the truck has a 16-inch-wide wheel stance! In addition to detailed chromed bumpers, roll bar, wheels and carbs, the truck sports a super redesigned suspension system and a heavy-

duty rotary speed controller. Had enough?

The designers at Kyosho's Monster Truck Division (MTD) didn't stop there! They threw in four, 6.6-inch, rubber, monster terra tires; four, light,

"This 'car-nivorous' beast is probably the most popular monster truck on the national circuit, and now you can own an uncanny, 1/10-scale clone!"

Kyosho* has joined forces with Everett Jasmer to create an R/C version of his 1988 World Champion Chevy USA-1. This "car-nivorous" beast is probably the most

high-tech features, and its overall dimensions make it the largest monster truck Kyosho has ever produced. The new 1990 Chevy Silverado polycarbonate body is

SLAM DANCE



durable, aluminum shock towers; eight coil-over shocks; and twin Kyosho Mega 360 power-wind motors—and they made the truck 4WD/4WS to boot!

ASSEMBLY

Before you assemble any R/C model, you should review the instructions. Kyosho has set the standard: its step-by-step manuals are easy-to-read and well-illustrated, and they include helpful building tips and precautions, details of the tools required for assembly, mainte-

nance suggestions and a list of optional performance parts.

Assembly begins with the gearboxes. Because the USA-1 has 4WD, you must build two identical ones. Even though the kit includes metal bushings throughout, I used a set of Kyosho's Option House ball bearings. They not only dramatically reduce friction and wear, but they also enhance performance and increase running time. If you use ball bearings, use the proper sizes to avoid misalignment.

As always, apply a lot of grease (it's included in the kit) to lubricate the contents of the gearboxes. After you've assembled them, test for smooth gear movement by turning the shaft joints on each side. If there's any resistance, open



the box and look for misaligned gears or shafts. When they're properly assembled, the joints should turn 360 degrees without binding or getting hung-up.

The next few steps cover assembly of the four knuckle arms. Kyosho completely re-engineered the USA-1's suspension: the new system is made of a stronger nylon plastic that's virtually impossible to crack or break—even under rough racing conditions. The knuckle-carrier/A-arm architecture is also new. Each knuckle arm is sandwiched

THE BIG ONE!



"I've wanted to see monster trucks involved in truly meaningful racing for years," says Everett Jasmer, owner of the USA-1. "After all, drag cars, Indy cars and NASCAR cars are legitimate motor sports because there's consistency in what they do, making it easy for the fans and the media to follow what they're doing."

Not only have Everett and the USA-1 team fought for standardization of the monster-truck-racing format, but they've also set an example of professionalism that has helped to improve the sport's image.

Everett's Chevrolet/True Value-sponsored USA-1 Chevy Silverado is built on a Chevy K3500 truck frame and has a 1500hp, 572-cubic-inch, supercharged Chevy big-block. This patriotic pounder sits on four Goodyear 66x43x25-inch terra tires that spin on 5-ton military axles, and it's a definite winner.

Even though the USA-1 team entered the 1988 season three months late, they had success with driver Rod Litzau. By mid-season, it was evident that the USA-1 was a dominant force that would set standards for monster truck racing. The USA-1 overcame 11 breakdowns and one devastating roll-over to win the 1988 TNT National Championship. The next year, even after suffering six crashes and missing 25 percent of the races, the USA-1 Team finished 3rd overall in the 1989 TNT Monster Truck Challenge! Both feats were clearly the result of a professionally coordinated team effort.

Everett Jasmer says, "I feel we have succeeded in helping to set standards for monster truck racing for years to come. By 'we,' I mean TNT, MTRA, me and my crew, and all the other racers who have taken part in the Renegades/TNT Monster Truck Challenge Series." We at *Car Action* concur.

It's a collective awareness of the "big picture" (like that of Everett's team) that will bring truck racing to new heights of professionalism in the future. The truck-racing scene would do well to adopt Everett's philosophy. All of us at *Car Action* wish him and the USA-1 team the best of luck!

The Chevy Silverado USA-1 has an imposing scale appearance. It's the first truck to pose a serious threat to the long-time champion Clod Buster.



between two carriers that provide an excellent pivoting axis and protect it from damage. The front carrier now has 10 degrees of caster built in, and this greatly enhances handling.

After you've installed all four dogbone-style nylon swing shafts, you're ready to assemble the chassis. This is about the only structure on the USA-1 that Kyosho decided *not* to redesign: the ABS-plastic tub design provides a good backbone for the truck's uni-chassis construction, and (along with the chassis-tub cover) it protects the electronic gear against dust, rocks and debris.

After attaching the front and rear gearboxes to the chassis tub, mount the four upper and lower A-arms to the gearboxes. Here again, Kyosho has improved the quality of the nylon composite (which adds strength), and the A-arms are much easier to adjust.

Radio installation is next.

I chose a new Futaba* Magnum PCM 1024 pistol-grip system, which offers push-button tuning, LED read-outs and high-resolution signal transmission for less interference. My PCM included two S132H servos. Although it's superfast, small and light, the USA-1's steering servo didn't have enough torque to turn the monster tires without

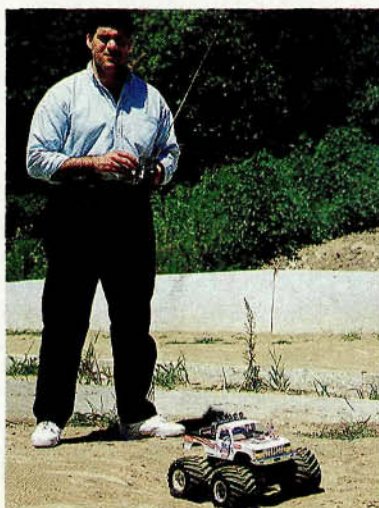
straining.

Now move on to steering-system assembly. The USA-1 allows you to choose between front-wheel steering and 4WS. If you want front-wheel steering only, don't install the 4WS rod that extends from the front-steering slide rail to the back rail, and place two screws on each side of the rear rail. If you want real driving excitement and quick, decisive turning, go for the 4WS setup and add the steering rod.

Assembly of the shocks and bumpers follows, and it's relatively straightforward. The USA-1's new shocks are an improvement on those in Kyosho's previous trucks. They provide a full 1 1/4 inches of travel for each wheel, and this greatly enhances the truck's performance. Remember to apply plenty of grease to each shock case for smooth movement.

One of the final assembly steps is the installation of the four aluminum shock towers. These recent additions pro-

"Kyosho completely re-engineered the USA-1's suspension: the new system is made of a stronger nylon plastic that's virtually impossible to crack or break—"



Dr. Joe "Monster" Bruni and the USA-1 make a threatening pair at the local track; both are built like true crushers!

USA-1

Type 4WD/4WS
monster truck
Scale 1/10
Sug. Retail Price
\$319.95

DIMENSIONS:

Overall Length 18.3 inches
Width 15.7 inches
Wheelbase 10.4 inches
Track (f/r) 11.4 inches

WEIGHT:

Gross (w/battery) 8.7 pounds

BODY:

Type 1990 Chevy Silverado
Material Polycarbonate

CHASSIS:

Type Tub
Material Plastic

DRIVE TRAIN:

Primary Pinion/gear
Transmission Gear drive
Differential Gear
Bearings/Bushings .. Bronze bushings

SUSPENSION:

Type (f/r) Lower A-arm;
upper control link
Dampening (f/r) Coil-over shocks

WHEELS:

Type (f/r) One-piece, chrome-plated plastic
Dimensions (DxW) (f/r) 4x2.9
inches

TIRES:

Front/Rear Rubber, off-road

ELECTRICS:

Motor Kyosho Mega Twin 360
Battery 7.2V, 1700mAh
Speed Controller Rotary 3-step forward/1-step reverse

OPTIONS AS TESTED:

Option House ball-bearing kit; Futaba Magnum PCM 1024 pistol-grip radio.

COMMENTS:

The USA-1 is very fast for a 4WD monster truck, and it has an excellent suspension system. A strong contender in the 4WD/4WS monster-truck market, it's sure to be a winner!

vide a rigid foundation for all eight shocks, and they show no tendency to move or warp—unlike the plastic ones on previous models. The twin Mega motors are wired in parallel to deliver equal power to the front and rear wheels.

Pay special attention to the pinion-gear installation. You must allow approximately 1mm between the motor case and the pinion; more or less space will cause the pinion and the spur drive gear to be misaligned. Before you tighten the motor-mounting screws, check their "mesh": if it's too tight, the motor will strain; if it's too loose, the pinion will strip the gear.

Wheel mounting goes quickly. Although the tires fit snugly on the rims, I recommend that you glue them for

insurance. (Mine slipped off after a few runs.)

DETAILS, DETAILS

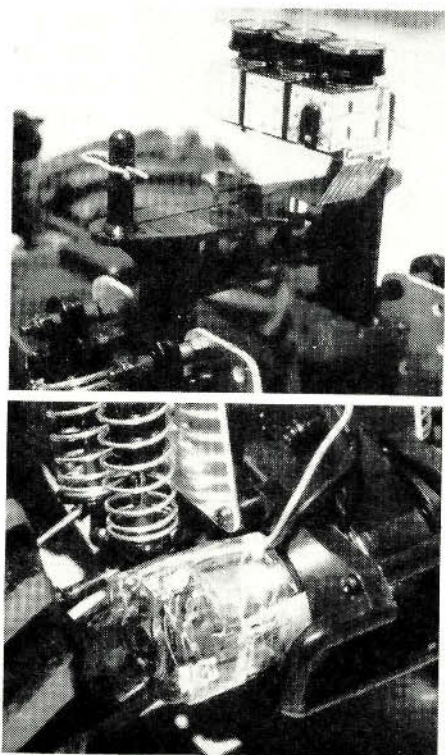
Because I was following a strict schedule, I sent the polycarbonate Chevy Silverado body to my trusty painter, Von Erich of GLD Race Cars. He applied one coat of Coverite's* new Wizard White and, within minutes, the paint was dry and ready for decals. Kyosho provides a complete decal sheet and all the chromed parts so you can replicate every detail of the full-scale truck. If you follow the picture on the box, detailing is easy.

IT'S PARTY TIME!

Several battery packs are available for the USA-1, and the battery compartment's unique undercarriage allows the use of virtually any flat pack. (I used a Kyosho 7.2V 1700mAh

Left: ■ Top: Because they're mounted on the chassis and not the body (they sit on top of the body-post cross-member), the chrome tri-power carbs give that realistic "shaker" effect.

■ Bottom: A Kyosho Mega 360 and a guard bar are at both ends.



PATRIOTIC POUNDER!

COMING NEXT MONTH!

R O A R OFF-ROAD NATS

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Oval Cornering
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RC10 Championship Edition
Traxxas TRX-T Eagle

COLUMNS

Dirt Digest
Scoping Out
Troubleshooting

USA-1

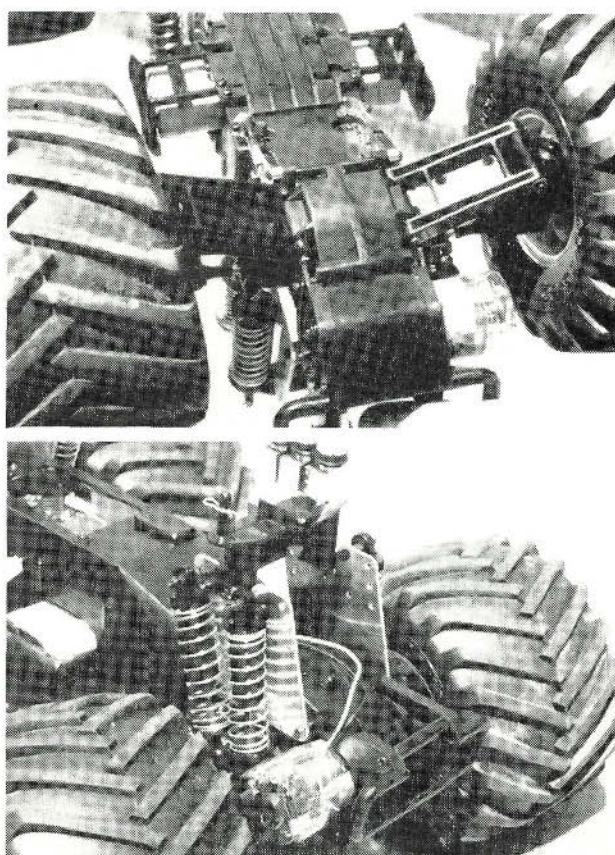
SCE.) Simply swing open one side of the compartment, slide in the pack, connect the plugs, and lock the door securely with a body pin. You'll appreciate this simple design—especially at the track where time is of the essence. Before racing, do a systems check and perform final steering- and throttle-servo radio adjustments.

tive and any brisk movement causes extreme rolling or tipping. Not so with the USA-1—no matter how fast I turned the Magnum's wheel control, turning was positive and precise.

As I became more confident, I gave the USA-1 more throttle and was impressed by its high top end. The more throttle I gave it, the more

dirt the tall monster tires seemed to kick up! The most impressive aspect of the truck was the performance of its new suspension system. I approached each jump at full throttle, and the truck consistently took off nose-high and then landed flat without rolling or hesitating.

The most convincing suspension test took place off the track, though. Before I left for the day, I used the last of the battery's reserves by running the USA-1 near a bunch of 4x4 wooden railroad ties. The truck climbed the ties without hesitating, and it never bottomed-out or showed signs of



■ Top: These long A-arms (which have a high nylon content) improve strength and provide an excellent 1 1/4 inches of suspension travel. ■ Bottom: Aluminum shock towers increase rigidity and offer more shock-mounting locations. The huge 6.6-inch terra tires are serious rubber!

When I switched on my Magnum PCM, the USA-1 immediately stood at attention awaiting my orders. With the help of master photographer Steve Pond, all the performance shots were taken at an R/C track in Bethel, CT. For the first round, I paced the truck to test its cornering and suspension capabilities. At first, I was skeptical about its 4WS system; in some models, the steering is overly sensi-

“chassis hang-up.”

Don't you think it's time for a shootout between the two giants of 4WD? Stay tuned!

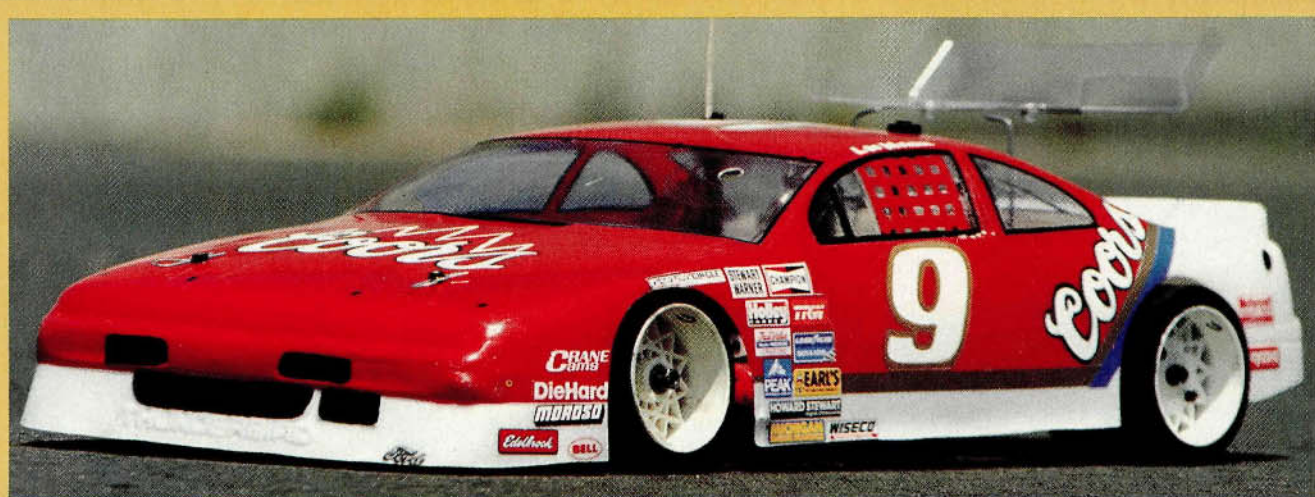
**Here are the addresses of the companies mentioned in this article:*

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Coverite, 420 Babylon, Rd. Horsham, PA 19044. ■

O N - R O



PHOTOS BY JIM SHEPKA

by JIM SHEPKA

WHEN LEO MOREAU found out that his off-road club was moving onto carpet for the winter, he had a couple of tough choices to make. He could:

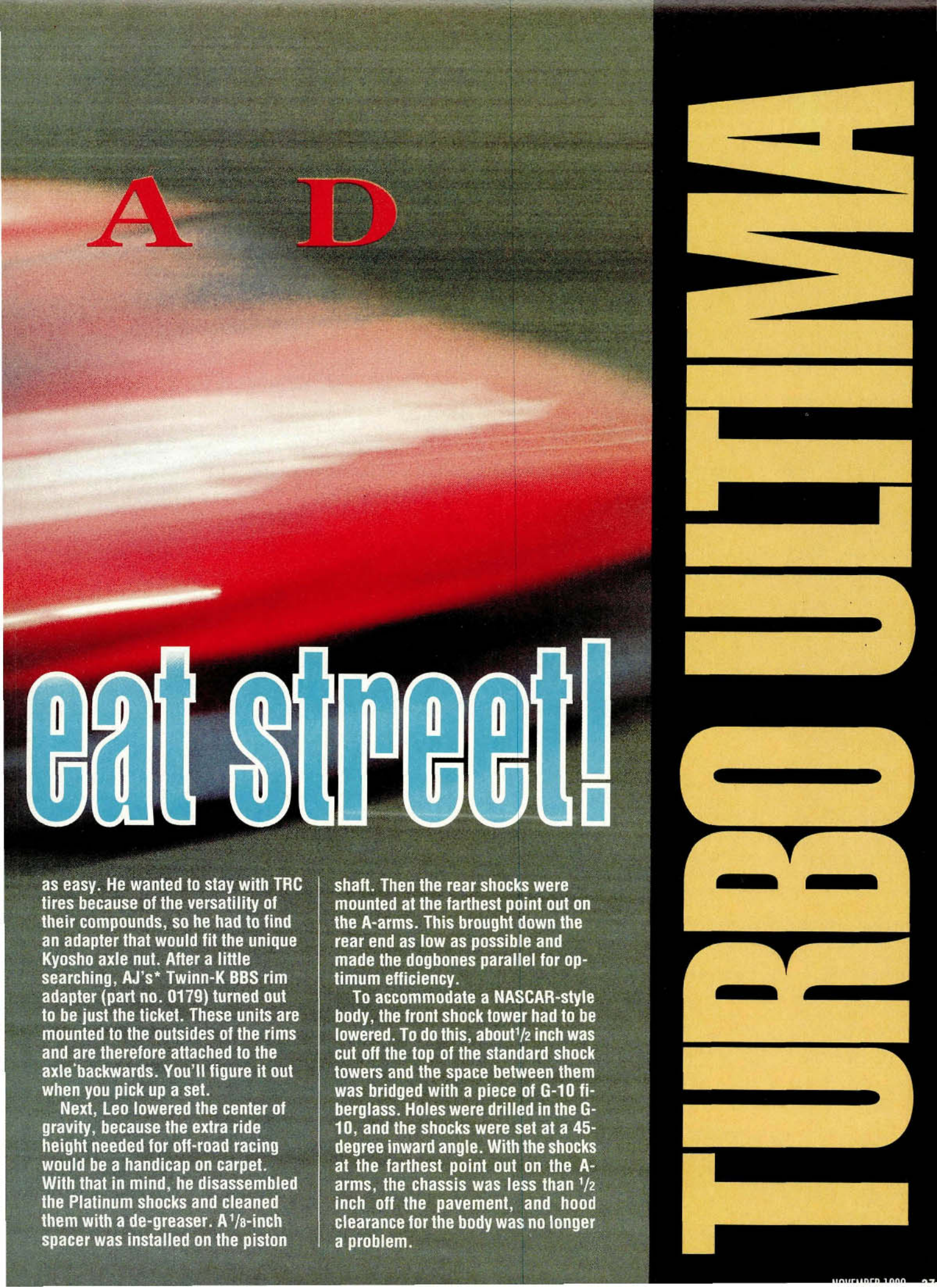
- convert his Kyosho* Turbo Ultima into an on-road racer;
- invest in a new pan car; or
- just put it on the shelf for the season.

He opted for numero uno, and his fellow racers have regretted his decision ever since!

First, Leo had to find a set of foam tires that would fit his Ultima and comply with the ROAR rule allowing a maximum width of 9.75 inches. After some experimentation, he discovered that the Ultima's front flange bearings fit a set of

TRC* pan-car rims perfectly. Unfortunately, he was running a pair of Andy's* A-arms up front on his dirt version, but when added to the TRC tires, they made the front end too wide. Simply going back to the stock A-arms (he also trimmed them to save weight) solved this problem.

Finding a set of rear tires wasn't



A D

eat street!

as easy. He wanted to stay with TRC tires because of the versatility of their compounds, so he had to find an adapter that would fit the unique Kyosho axle nut. After a little searching, AJ's* Twinn-K BBS rim adapter (part no. 0179) turned out to be just the ticket. These units are mounted to the outsides of the rims and are therefore attached to the axle backwards. You'll figure it out when you pick up a set.

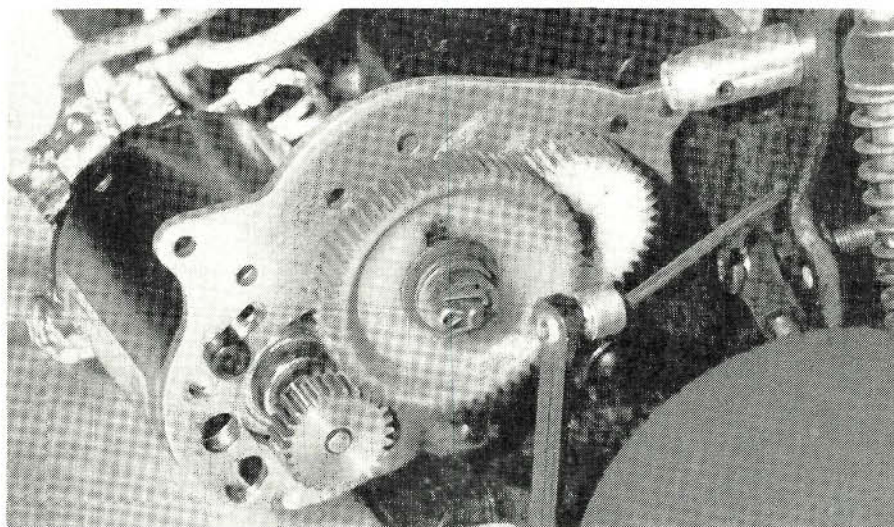
Next, Leo lowered the center of gravity, because the extra ride height needed for off-road racing would be a handicap on carpet. With that in mind, he disassembled the Platinum shocks and cleaned them with a de-greaser. A 1/8-inch spacer was installed on the piston

shaft. Then the rear shocks were mounted at the farthest point out on the A-arms. This brought down the rear end as low as possible and made the dogbones parallel for optimum efficiency.

To accommodate a NASCAR-style body, the front shock tower had to be lowered. To do this, about 1/2 inch was cut off the top of the standard shock towers and the space between them was bridged with a piece of G-10 fiberglass. Holes were drilled in the G-10, and the shocks were set at a 45-degree inward angle. With the shocks at the farthest point out on the A-arms, the chassis was less than 1/2 inch off the pavement, and hood clearance for the body was no longer a problem.

TURBO ULTIMA

Right: A Trinity under-drive counter-gear and Speedworks motor combine to produce awesome torque in the turns. Note the polycarbonate motor cover that's attached to the chassis plate and the rear-suspension guides. It works very well!



Through trial and error, Leo went with 5WT oil and a soft spring setting in the rear and a firm setting in the front—a setup that suits his driving style. He replaced the small, stock, front bumper with a scratch-built one made of 1/8-inch polycarbonate, to which he mounted 1 1/2-inch body posts.

He also swapped the standard chassis tub and radio plate for a new, Trinity*, graphite,

oval plate (part no. 8028). This allowed the radio gear to be moved from the top plate, and the Futaba* steering servo, the

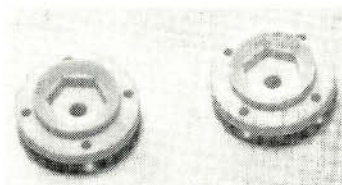
receiver, and a Trinity 6-cell SCR battery pack to be mounted as low as possible. (This minimizes weight shifting in corners.) To obtain the offset necessary for the ovals, Leo attached an Associated battery tray to the left side of the chassis. A Novak* T-1 electronic speed controller and a Deans* two-piece antenna complete the electronics package.

In the transmission department, Leo added a Kyosho ball differential and a Robinson Racing* center gear—a 48-pitch gear that helps to reduce drag and increase efficiency. On the outside of the gear case, he installed a Trinity 62-tooth under-drive counter gear (part no. 0506) instead of the stock unit. A Trinity Speedworks motor provides all the horsepower “lightning Leo” will ever need.

Had he finished?—no way! Leo the “lionhearted” did even more! At the rear, he attached a thin piece of polycarbonate to the chassis between the suspension guide and the chassis plate. This shields the motor from dirt, and I’m amazed at how effective it is. (I highly recommend this trick.)

Leo’s conversion can usually be seen tearing up the track on Monday nights at Mike’s Speed in Hadley, MA. With his favorite NASCAR paint

scheme on an Andy’s Thunderbird (the logos are hand-painted by his friend Jack Cooper), his Turbo Ultima conversion is a real good-looker. The versatil-



AJ's Twinn-K hub adapters allow the use of a variety of on-road tires. TRC green dots are used on Leo's Ultima.

ity of its suspension and tires and its smooth transmission make this car a joy to watch and drive. If you’re looking for a new racing experience, update your Ultima and go for the gold.

**Here are the addresses of the companies mentioned in this article:*

Kyosho/Great Planes Model Distributors, P.O. Box 4021 Champaign, IL 61820.

TRC, P.O. Box 1058, 2211 Charter St., Albemarle, NC 28002.

Andy's R/C Products, 466 W. Arrow Hwy., Unit K, San Dimas, CA 91773.

AJ Products, 441 Bahr Dr., Ben Lomond, CA 95005.

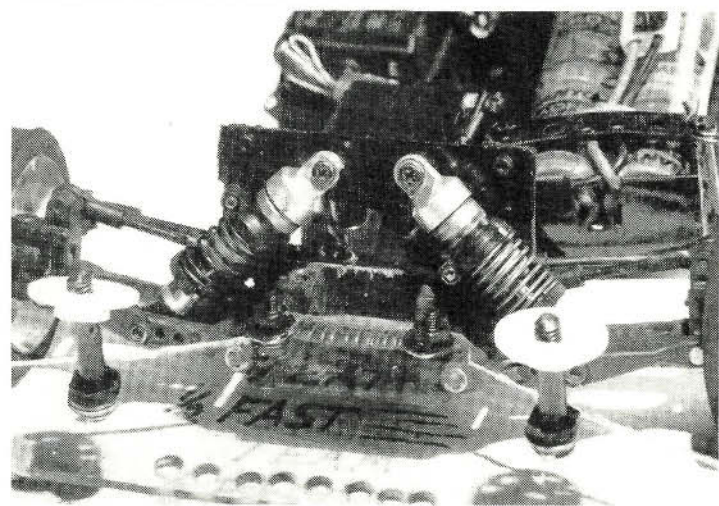
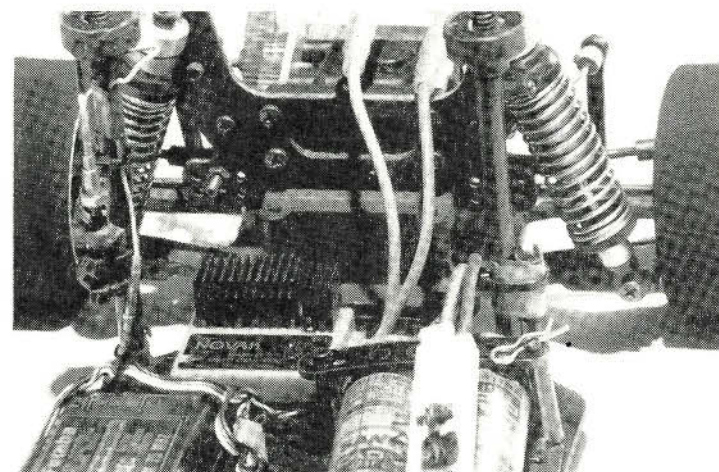
Trinity, 1901 E. Linden Ave. #8, Linden, NJ 07036.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

Deans; distributed by Ace R/C Inc., 116 W. 19th St., Box 511C Higginsville, MO 64037.

Robinson Racing Products, 165N Malena Dr., Orange, CA 92669. ■



■*Top: The chassis plate offers a smooth surface on which to mount the electronics versus the stock unit. The rear body posts are mounted directly on the chassis. In this application, the battery is offset for oval running. ■ Bottom: A piece of G-10 was attached to the shortened shock towers. The shocks were then mounted to the G-10 at a 45-degree angle. This allowed the body to be lowered without further modifications. Note the scratch-built front bumper.*

TROUBLESHOOTING

by STEVE POND

If you have a technical problem that your hobby shop or racing friends can't solve, give us a shout at Radio Control Car Action, and we'll see if we can find a solution for you. Questions should be technical and should be addressed to "Troubleshooting," c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



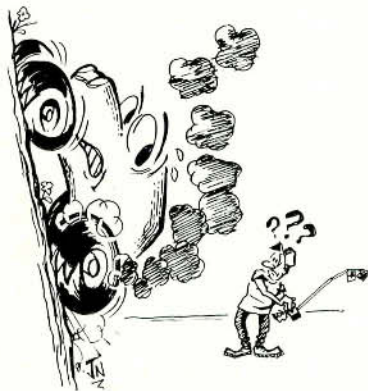
NO NEED FOR SPEED

I own an RC10 and have a problem with my hand/eye coordination (I'm considered handicapped), but I still enjoy a romp with my car. The car goes too fast for me, and I want to slow it down. I've tried changing the spur-and-pinion gear, but the car still travels too fast. Can I cut my battery pack down to four cells? Would the car still run? Would it harm the motor? I'd also like to extend my running time. Can I hook up more than one 4-cell battery pack in a parallel circuit?

Michael Maroney
Williamson, NY

Reducing your battery packs to four cells would certainly slow your car enough, but make sure that the receiver is still being supplied with enough voltage to operate properly. If you use an electronic speed controller, ensure that the unit is capable of operating on four cells. Some of the cheaper units will only work on 6 to 7 cells, but some of the better ones can operate on 4 to 8 or 10 cells. In most cases, the speed controller will have jumper wires that must be connected when you use four cells. If you use a mechanical speed controller with a BEC, the BEC must be modified to prevent voltage drop.

With the reduced number of cells and the low gearing you mentioned, you should see run times well into the 15-minute range without harming your motor. I don't advise you to run two packs in parallel, because the additional run time and consequent heat buildup may have an adverse effect on the motor.



UPHILL BABBLE

I'm about to buy a Midnight Pumpkin. I want it to run at its best, so I plan to buy a 1700mAh battery, a Monster Mash motor and a Novak speed controller. The man at the hobby shop said, "When you put a 1700mAh battery in with an electronic speed controller, it burns out the controller." He said this will happen when your truck climbs a steep hill. The powerful 1700mAh battery will give so much juice that the motor stalls and the speed controller blows. Is this true? If so, what's the solution?—without spending too much money. Should I forget the 1700mAh battery, or should I stick to a mechanical speed controller?

Clinton Verity
Roanoke, VA

I certainly hope you misunderstood what this guy at the hobby shop told you. If that is, in fact, what he told you, he should consider another line of work! The 1700mAh SCE cells are actually less capable of delivering the "juice" you refer to, than the 1200mAh SCR cells.

The SCE cells have an internal resistance of 5.5 milliohms compared with the 4.0 milliohms of the SCR cells. (An ohm is a unit of measurement of electrical resistance.) Think of it this way: the 1700mAh SCE cell is a hose

with a 2-inch diameter; the 1200mAh SCR cell is a hose with a 3-inch diameter, and water represents the current you're trying to push through the two hoses. It's easier to push more water through the larger hose (the SCR cell) because it offers less resistance. So, what the hobby-shop guy supposedly told you is actually the furthest from the truth.

There's no way a 1700mAh battery can blow a speed controller, so don't give it another thought. When you're buying batteries, consider that the 1700mAh battery is more delicate than the rugged 1200 SCR. It takes some fine-tuned charging skills to get the most out of 1700mAh batteries, but the 1200mAh SCRs tolerate erratic and frequent charging.

As far as blowing the speed controller when going uphill, there's only a one in a million chance of that happening. I recommend that you stick with the 1200mAh SCRs and check out a new hobby shop!



ILLUSTRATIONS BY JIM NEWMAN

YELLOW DOT DRIBBLE

I own a totally tricked-out RC10: full bearings, Andy's arms, graphite chassis, a Trinity 15-turn modified and Losi bellcranks. The car is really fast and runs smoothly, but when I turn, my front tires bounce. I use Bolink Fastrack Foam slicks and a front stabilizer on the front Andy's arms. I've tried everything—adjusting the shocks, taking off the stabi-

lizer and adjusting the steering rate on my Magnum Jr., but the front tires bounce, even at half throttle. What aftermarket product would cure this?

"Bouncing" Brian Kerr
Willoughby Hills, OH

I assume that you're running your RC10 on asphalt or concrete, and that you've made one of the classic mistakes concerning the use of foam tires.

Many newcomers to on-road racing look at the variety of tire compounds and mistakenly choose the softest (yellow dot) tires because the tire chart says they give the best traction. Although the yellow tires do provide better traction than other standard foam tires, you can have too much.

When you run on a high-bite surface, soft tires aren't the way to go. As your car gets farther into a turn and lateral acceleration increases, the tires are pushed to a point where they can no longer grip properly. Instead of rolling smoothly, they break loose, then grab again until they can no longer hold on, then break loose and so on.... This happens rapidly and, on pan cars, is referred to as "chattering." On a converted off-road car, there's much more suspension travel, and this may cause the wheel to bounce as you describe.

Why not try harder tires? In fact, use the hardest tires you can that will still allow traction. Harder tires cause much less rolling resistance and wear much better than softer tires. You should also try changing to a heavier shock oil for running on carpet or asphalt. The exact oil weight will be determined by the track conditions, but I don't think you should use anything lighter than 50WT in the rear and 60WT in the front.

Try these suggestions; you should see your car taking those turns much faster.



DAMPER DILEMMA

I have several questions about the JR-X2, which I've been racing for about a year. The car is great, and about two months ago, I bought a Losi Performance kit for it. Updating it according to the instructions was no problem, until I got to the rear shocks.

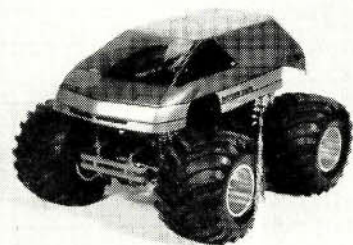
The directions tell you to swap the bottom mounts for the ones included in the Pro Kit and mount them accordingly, but which piston should I install in the rear shock? My kit came with one-hole pistons, but the kits have been updated and now have three-hole pistons. My hobby shop sells only the three-hole replacements for kits that started out as one-hole kits. Which one will give the best performance on the rear shock?

The owner of the hobby shop says I should stay with the single hole, but other drivers have told me to use the three holes, since the front shocks contain drilled-out, three-hole pistons. What do you suggest?

My next question is about bump-steering. What is it?! I recently read an article about how to eliminate it on the JR-X2 by re-drilling the steering-arm holes. To eliminate the problem, the writer suggested drilling new holes, 1/4 inch further in toward the center than the original holes. This article was to be used with the Performance kit's instructions. Because I don't know what bump-steer is, I don't know if I should modify my car further. What do you suggest?

My final question: which Futaba servo would you suggest for the JR-X2?

DAHM'S
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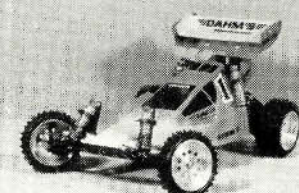
AVENGER 2000™ (FUTURE VAN)



1990 - FIREBIRD - SPICE GTP



THRILLER™ (1 ISSAN PATHFINDER)



WARRIOR II™ and FX WING™

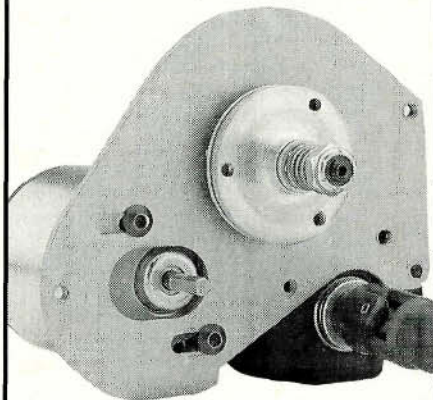


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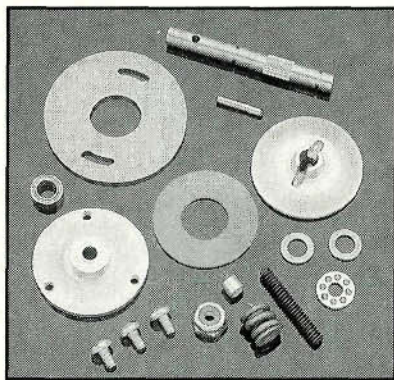
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TROUBLESHOOTING

(Continued from page 43)

After switching from an S148 model, I now run an S132-H servo for minimum weight and high speed. I've been told that one recommended for the JR-T should be run in the JR-X2 also, because of its high torque and lightness. I think it's the S130 model. What's your opinion?

D. Ryan
Beaumont, TX

The answer to the question of which piston to use in shocks that have optional pistons falls into the "whatever feels good" category. Some racers have found a good shock-oil/piston combination, but there's no guarantee that their combination will work well for you on your track. The variety of pistons is intended to make the shocks more versatile and easier to adapt to a variety of tracks.

The single-hole piston must be used with a lighter oil because forcing a heavier oil through the hole would slow the damping action too much. In situations where you think you need a lighter oil, but you're already down to 5WT with the single-hole piston, you can move to a three-hole piston and 20WT oil. The variety of pistons allows you to use a variety of oil viscosities with similar results, but there's no better piston.

Use whichever piston you choose for the rear shocks on the front shocks, too. Better yet, find out which piston the fastest drivers at your club use, and use exactly the same one. Then, when you have handling trouble, they can tell you which oil to use without having to factor-in a piston difference.

Your next question had me scratching my head. Having raced JR-X2s for a while now, I've never noticed that the car had any bump-steer. I know you didn't read the article you mentioned in Car Action, and I seriously question the source of this information.

As for bump-steering, it's usually the result of poor suspension geometry. When the steering linkage isn't the same length as the A-arm, it causes changes in the toe alignment. In simple terms, when the suspension is compressed, the front wheels will either point toward each other or turn away from each other. When entering a turn, the outside front suspension (which usually bears most of the weight) compresses, and the wheel will turn more than you expected. This

makes the car especially sensitive in turns and causes erratic handling on straights. The JR-X2's suspension geometry is just about as good as it gets, so don't worry about bump-steering—you don't have it!

Finally: I think you're looking for the FP-S131S servo. It's the one most often found in 1/8-scale gas-powered cars and 4WD electric cars. Futaba also has a servo called the FP-S135S, which is smaller than the 132, has more torque and almost equal speed. On a 2WD car, for steering, the 135 is all you should need.



1200 vs 1700

I'm 12 years old and have a JR-XT that's getting run times around 21/2 minutes. My local hobby shop told me that I was running on a 1200mAh 7-cell battery and should move up to a 1700mAh 7-cell battery because of my motor. I'd like to race locally, but I don't know whether the 1700mAh batteries are legal. Are they? Will a Pro-Tech 702 charger be able to charge them, and will they increase my run time?

Kishan Dwarakanath
Bloomington, MN

The 1700mAh cells are legal at most tracks, but it doesn't sound as if the type of cell you use is causing those brief run times. If you're only getting 21/2 minutes out of a 1200 battery, even switching to a 1700 won't get you over the 4-minute mark. In fact, at many tracks in the R/C Car Action area (Connecticut), in the modified classes, racers are doing very well with matched SCR packs. For your JR-XT, try using a smaller pinion gear to improve your run time. Your hobby shop's recommendation of moving up to a 1700mAh battery isn't totally off base, but you may be running a motor that's too hot for your truck (hotter motors eat up the battery much faster). Try a different one. Motors in the 15- to 18-turn range work well with racing trucks in most applications.

The 7-cell battery could also be the cause of your problems. If you're already

down to the smallest pinion you can find, perhaps removing 1.2 volts (one cell) would slow down the motor enough to keep your runs in the 4-minute range. (With the same gear ratio, a 7-cell battery will dump before a 6-cell battery.)



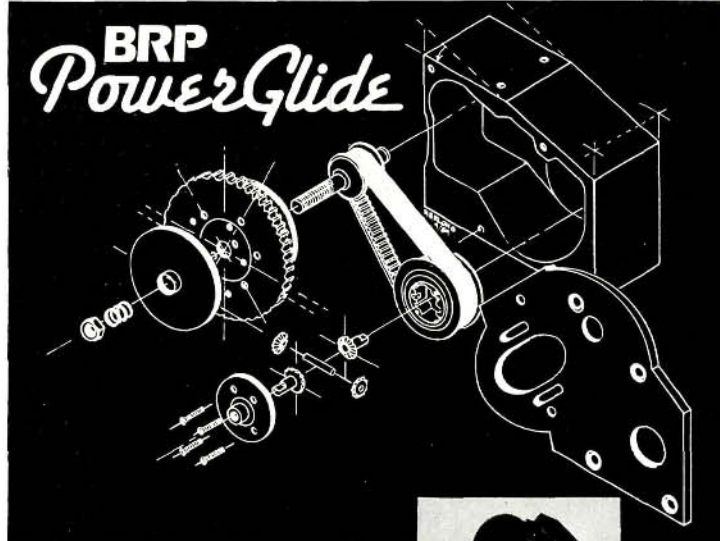
MOWIN' FOR MOTORS

My truck has a LeMans 360 ST motor for which I recently bought bearings. I want to buy a new endbell for it, too, but my LeMans is a 550-size motor and all the modified endbells I've seen are 540 size. Would it matter if I used a Trinity endbell? If not, what could I get? I was told that modified motors have screws instead of tabs. If I used an endbell, would I have to buy a new can and, if so, which should I get? A guy at the local track said I should just buy a new motor, but he has big bucks and I'm just a 14-year-old kid who earns his money mowing lawns. Could you help me?

Brian Lewis
Northboro, MA

The 550 motors resemble almost all the 540 motors in every way but length. The 550 motors use a longer armature and, hence, a longer can. A Trinity endbell should fit most Kyosho motors, but hold the boat! Your 360 ST has a sealed endbell that's very much like the endbells on the 540-class stock motors. To remove the endbell, you'd have to bend the tabs that hold it in place, and this might cause permanent motor damage. Even if you did manage to get the endbell off cleanly, you'd have no way to attach the modified one.

Instead of modifying your current motor, why not pick up one of the available budget modified motors. (Check page 40 of the August issue of Car Action.)



5000 RC-10 Trans
5001 Ultima Trans
\$129.95

Ball Slipper Clutches



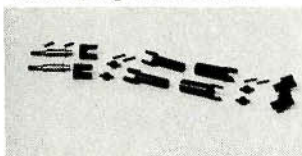
Fits:
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I had a little of everything and not nearly enough of anything! Nevertheless, after my experience with the Maximum Clod, I knew I could join these bits and pieces to make another monster. First, I discovered that there's a shortage of Clod parts... It seems that everybody wants them — not just to replace broken parts. Someone discovered that the Clod differential is the most versatile piece of R/C hardware ever known, and modelers are rapidly eating them up.



Sitting there with a box of spare parts from my Maximum Clod, I had the urge to assemble, but I had a problem:

p r o j e c t

by BILL O'BRIEN

CLOD BUSTER



Sumo Sled Slinger

DRIVE TRAIN

One of the biggest problems with the Clod Buster as a pulling truck is its differentials. Having two is good, but plastic diffs just aren't up to the task of pulling serious weight. As the

stress increases, more and more of the plastic parts will crumple.

The solution?—beef up the diffs as much as possible, and not much is beefier than good old steel. Custom Chrome* steel Clod gears can be

used to replace every gear in the diffs (ball bearings are a must), but they weigh a bazillion pounds. With a pulling truck, I didn't have to worry about weight, though, so in they went.

Because the gears are solid, the diffs act a little differently. They don't slip, so the left and right wheels turn at the same rate, in the same direction, at the same time. It's like running locked diffs; in fact, these are the most locked

diffs you'll ever run. They're a little noisy, but grease them well, and you won't notice it. (Custom Chrome recommends a lithium-based grease rather than any of the ceramic greases that we usually use in R/C. And the word "recommend" is used here in the same way that it's recommended that you don't walk off the top of a building!)

CHASSIS

The chassis is aluminum, and it's from APM in New Jersey. It's a little cheaper than the Sassy Chassis version, but it looks very much like it—with one notable exception. The APM chassis has no cutouts for a stick battery pack. If you don't plan to lay down some hefty 4000mAh or 2000mAh batteries in the front or rear cradles (they're the same as on the stock chassis), you won't find anywhere to put a normal stick pack.

Incidentally, the APM chassis finish can't be compared with the finish of a Sassy chassis. It's of brushed aluminum that you can attack with 600-grit wet-or-dry sandpaper to bring out a lustrous sheen, but I'd never enter it in concours. On the other hand, I don't hesitate to take a hacksaw to it and modify it until the cows come home. (Its lower price helps my conscience!) The choice between the

VIVA LA BIONIC BUSTER!



I REMEMBER WHEN I first heard the scoop on Tamiya's new monster truck: I was at a hobby shop with friends. We all thought it sounded like the product of a madman's nightmare! (At the time, we were all used to Blackfoots and Monster Beetles.) The idea of a twin-motor, eight-shock, 4WS beast just blew our minds, and when it arrived at the store, we rushed in to check it out.

Whaddya know?!—It was even better than we had imagined it would be! It didn't take my friend Ace long to decide he *had* to have one, and we soon began beast building. It was clear from the start that this truck was a departure from previous Tamiya kits: I could tell that it was designed to take abuse.

As soon as we were ready, we headed out to rough terrain and put the Clod to every test we could think of. It climbed, did wheel stands and a few rollovers, but nothing fazed it, and its mammoth tires drove over every obstacle. We even made it pull me down the street on my skateboard. I could tell this was the start of something *big*!

two companies' chassis is much like that between beauty and the beast.

I wanted to make a



PROJECT CLOD BUSTER

beast, so I hacked away the bottom at the front and back, and then I cut a curve into each side where the motor would sit when the differentials were installed. (The reason for this will soon be apparent.) Of course, when I took out the front and rear cradles, I had nowhere to put a battery, so I had to build a battery shelf. For this, I used aluminum stock. (You'll find small aluminum sheets in a variety of thicknesses at most hobby stores.)

SUSPENSION

All right, I confess!—my pulling Clod doesn't have any suspension! With this truck, the only shock you'll see is on the faces of people when they realize that there are no shocks (or springs) between the chassis and the differentials. I haven't lost my mind. If you look at a full-size pulling truck, you won't see anything

resembling a suspension, so why should there be one on a scale truck?

So what holds the bottom to the top?—Du-Bro* 4-40 turn-buckles and EZ-Link rod ends. If that sounds too simple, you're right; it is. Just by twisting the rods, I can adjust the height of the truck, or change the front-to-rear height bias. The setup lowers the chassis by about $\frac{3}{4}$ inch, and that's why I needed the chassis cut-outs for the motors: they're now up inside the chassis.

STEER CLEAR

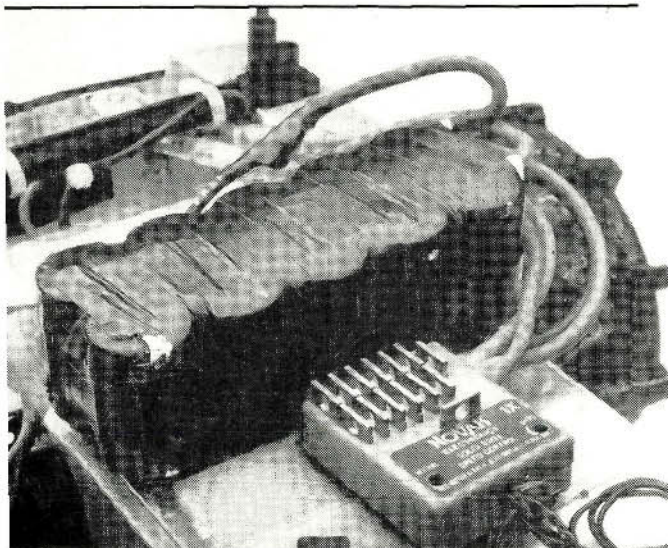
The steering servo-saver arms are also in-

side the chassis, and that causes a few problems. First, you'll have to raise the height of the steering servo—and I'm not just talking about throwing a washer under there. I re-mounted the servo in the chassis, not in the lower stirrup where it's supposed to be. That's the only way to do it if you want to maintain a nearly level attitude for the steering rods.

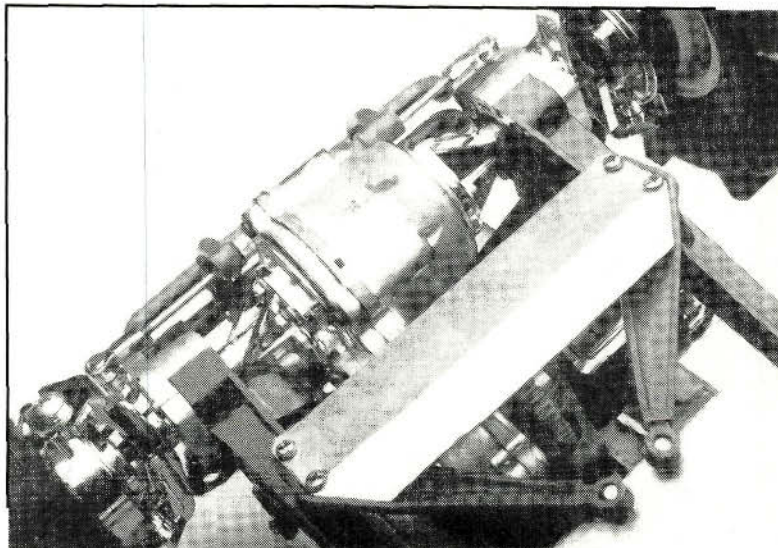
Did I say steering rods? Actually, the stock steering rods are too long for this setup. I had to hunt down another rod bag and use the cross rods that usually join the left and right wheels. They're the correct length.

WHEELS AND TIRES

The choice of wheels and tires was really tough. At the time the



Regulated by a Novak 1X, 10 cells supply the necessary jolt. Mounting platform was cut from aluminum sheet (see text).



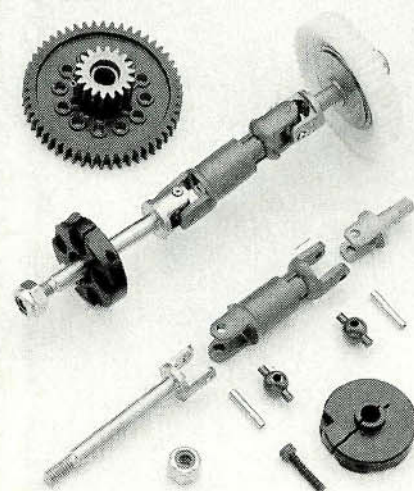
For superior strength, the aluminum cross-plate spans the ladder arms. APM's Steel Custom Chrome Clod gear are housed in the stock Tamiya case.

NEW FROM THORP

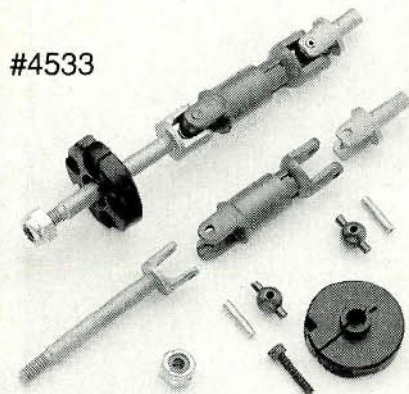
Thorp Manufacturing's introduces three new kits to help you get even more performance from your Blackfoot and RC-10. Check 'em out!

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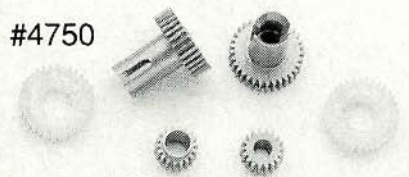


#4533



For your RC-10:

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PROJECT CLOD BUSTER

Clod was built, Imex* made the only tires with tread suitable for pulling, and they were designed for the Tamiya Lunch Box. I set out to tackle the situation. Luckily, just then, Bru-Line* released Clod

Buster hubs for their Super System wheels. I bought a pair of their widest wheels, stuck the Clod hubs into them and took a long hard look.

There are several ways to set up a pulling truck; basically, you aim for either a carpet or a dirt track. For a carpet track, you need a hard tire and relatively slow speeds because carpet provides a great bite. For a dirt track, use a very soft tire and high speeds. New York City isn't exactly filled with dirt pulling tracks, so I aimed for a carpet setup. The problem is that the Imex tires are soft—very, very soft!

BAD BRAIN BRAINWAVE!

Now you'll discover why the folk at R/C Car Action have nicknamed me "Bad Brain."

Twinn-K* sells a foam slick for the Blackfoot. It's not cheap, but it does fit the Bru-Line wheels, so I bought and mounted two pair. Because I had made the wheels

slightly wider than usual, there was still space around the rims when the foams were on. That's what I needed, because I wanted to mount the Imex Lunch Box pulling tires over them. Get

so I wanted low ground speed with a lot of torque. To achieve that, I borrowed the 4:1 gearboxes (132:1 final drive) and Black Magic motors from my Maximum Clod. (Don't worry, I replaced them

with Trinity* Monster Mash motors on max.)

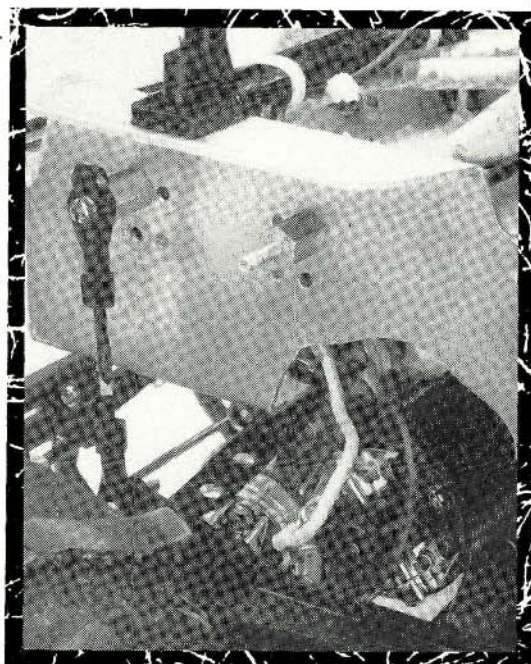
Now we're talking about a truck that's so slow and ponderous that if you put it onto a carpet and hold it to prevent it from moving, you start to kick up little pieces of carpet. NR/CTPA rules allow the use of up to 12 cells, but I only had a 10-cell pack, so I attached it to a Novak* Pro-1X Tempfet controller. A lot of pullers use the racing Novak

controllers, especially since the high-voltage version wasn't introduced until recently.

BODY FUNCTIONS

The body was the last thing to be added. Admittedly, it was a body left over from my Maximum Clod, but I just didn't want to plunk it down on the chassis. (That would have been so gauche!) So I chopped the cab about 1/4 inch at the A-posts and, heating the back of the plastic body with a soldering iron, I "raked it down" enough for it to bend, but not warp. (Kids, don't do this at home.

(Continued on page 54)



Rigid but adjustable "suspension" links were made from Du-Bro 4-40 turnbuckles and EZ Link rods. This method lowers the suspension, and the chassis' bottom had to be cut out to accommodate the motors.

the picture? Well, try this: the Lunch Box tires are meant to be mounted on a much shorter wheel than even the Bru-Line ones. I was trying to get them over the wheel and over the 5-inch foam tires.

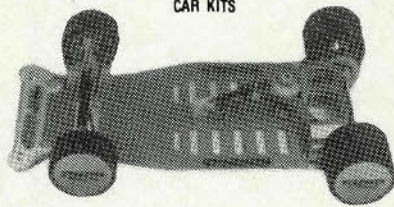
The result is a wheel-and-tire combination that's a little shaky at the side walls but like a rock around the circumference. Of course, this costs about \$25 a corner, but I quieted my conscience by thinking that custom wheels alone would have cost that much (if not more).

LOCAL MOTION

As I said, this Clod was being set up for carpet,

Top 100

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NOVAK 4300	99.95
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NOVAK - 410 - MXC	118.95
NOVAK - 828 - HV	118.95
NOVAK - T-4	64.95
TEKIN - 700 - w/Tork Adj.	118.95
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TEKIN - 310 - w/Tork Adj.	65.95
TEKIN - ERM80 - Reverse Module	39.95
Dialed 100 Amp w/Reverse	59.95

MOTORS

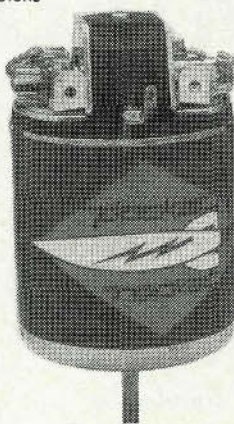
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2002 Annihilator (11D)	43.95
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TR 5202	\$29.95
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AND 3480 RC10 Molded Graphite Chassis	39.95
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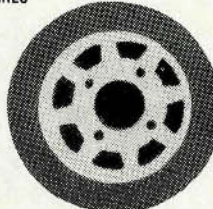


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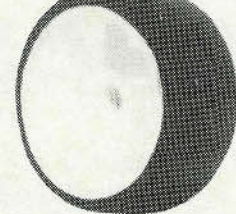
TIRES

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1492 Front Silver (Firm)	11.00
1590 Rear Red (Soft)	12.00
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1000 Rears 1/10 (Firm)	18.95
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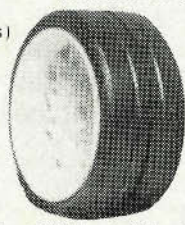
(Concrete & Asphalt Donuts)	
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9836 Fronts 1/10	18.95
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19845 Rears 1/12	14.95



PROJECT CLOD BUSTER

I didn't want to put a roll bar in the cab but it looked really empty. I remembered seeing an ad for a Lexan camper cap designed for the Clod, but I couldn't find it, so I bought \$6-worth of balsa and plywood and made my own. At the hobby store, I saw a RAM* police-light bar, and I had to buy it.

That's basically how everything went together, but the light bar had no holes for the strobe lights, so I never did more than install it. Still, that's how Moe (short for my Monster Clod) turned into a police hauler.

TRUCK TRYOUT

Don't ask! We hooked Moe up to the Hot bico* sled and had absolutely no performance—sort of what I expected. Remember when I mentioned the different setups needed for dirt and carpet? Guess where we ran Moe!

With a truck set up for pulling on carpet tracks, I end up in the dirt! Its tires were too hard and its speeds too slow to make much headway against the weight. Of course, shooting schedules allow no time for changes. I have two bald patches on a rug in my living room!

WHAT'S NEXT?

A lot has happened since the original Monster Clod was built. Novak introduced its high-voltage controller, and Imex released "full-size" Clod tires with pulling treads, so Moe has a set of very soft full-size tire at the rear and smaller Lunch Box tires up front (and no foam liners!). Everything else is just a matter of tweaking, and pulling creates some of the oddest tuning predicaments.

Tracks differ because they have different soil or brands of carpet. So what do you do?—easy! You run a few practice pulls to discover the optimum setup. Then you head for the sled and pull till it hurts.

As for me, with Max and Moe finished I start Minnie tomorrow. It will be a kick down the quarter-mile. Think about it!

*Here are the addresses of the companies mentioned in this article:

Custom Chrome Parts Mfg., 36175 Plymouth Rd., Livonia, MI 48150.

Du-Bro Products, 480 Bonner Rd., Wauconda, IL 60084.

Imex Model Co., 53 Trade Zone Ct., Ronkonkoma, NY 11779.

Bru-Line Industries, Inc., P.O. Box 3786, Center Line, MI 48015.

Twinn-K, Inc., P.O. Box 31228, Indianapolis, IN 46231.

Trinity, 1901 E. Linden Ave. #8, Linden, NJ 07036.

Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

RAM, 4736 N. Milwaukee Ave., Chicago, IL 60630.

Hobbico/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

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by STEVE POND

ACHIEVING CELEBRITY status in any form of racing obviously takes effort. Certain racers arrive on the scene and then vanish, but those who become household names are the ones who have made a firm commitment to racing.

R/C racing has its own stars—Jay Halsey, Joel Johnson, Cliff Lett, Gil Losi and others. R/C fans recognize their names and know that they're dyed-in-the-wool enthusiasts who approach the sport with the utmost dedication. The payoff for them has been tremendous racing success!

A STAR WAS BORN...

Masami Hirosaka is a racer who now belongs in this elite group of drivers. He was virtually unknown until, as a privateer, he captured the 4WD crown at the 1987 IFMAR Off-Road World Championships. Since then, racing under the Associated/Yokomo/Reedy* banner, he has swept every world title except for the 1/8-scale on-road.

Originally from Japan, Masami is R/C racing's equivalent of baseball's Lou Gehrig or basketball's Michael Jordan—a born natural. He has mastered the art of driving R/C cars and has become a very adept mechanic.

Like many top drivers, Masami repeatedly tests his cars to refine their handling, as well as his driving skills. From the driving



Machine Supreme

side, the results of this practice is quite obvious, but the most you usually see of his cars is a passing glimpse as they blow your polycarbonate doors off! He has become the foremost driver in R/C racing with a World Championship in every type of racing in which he has competed.

With the assistance of Associated Electrics, Masami agreed to send us his Yokomo to show the rest of the world how he set it up for the St. Ives track and, ultimately, his second, consecutive 4WD Off-Road World Championship! Before I go into the details about Masami's car, I must extend a warning: it's set up to suit his driving style and the track conditions at the St. Ives facility during the World Championships. If you decide to try some of the setups used on this car, be aware that it could be like wearing your big brother's clothing—they may look like your clothes, but the fit just isn't there!

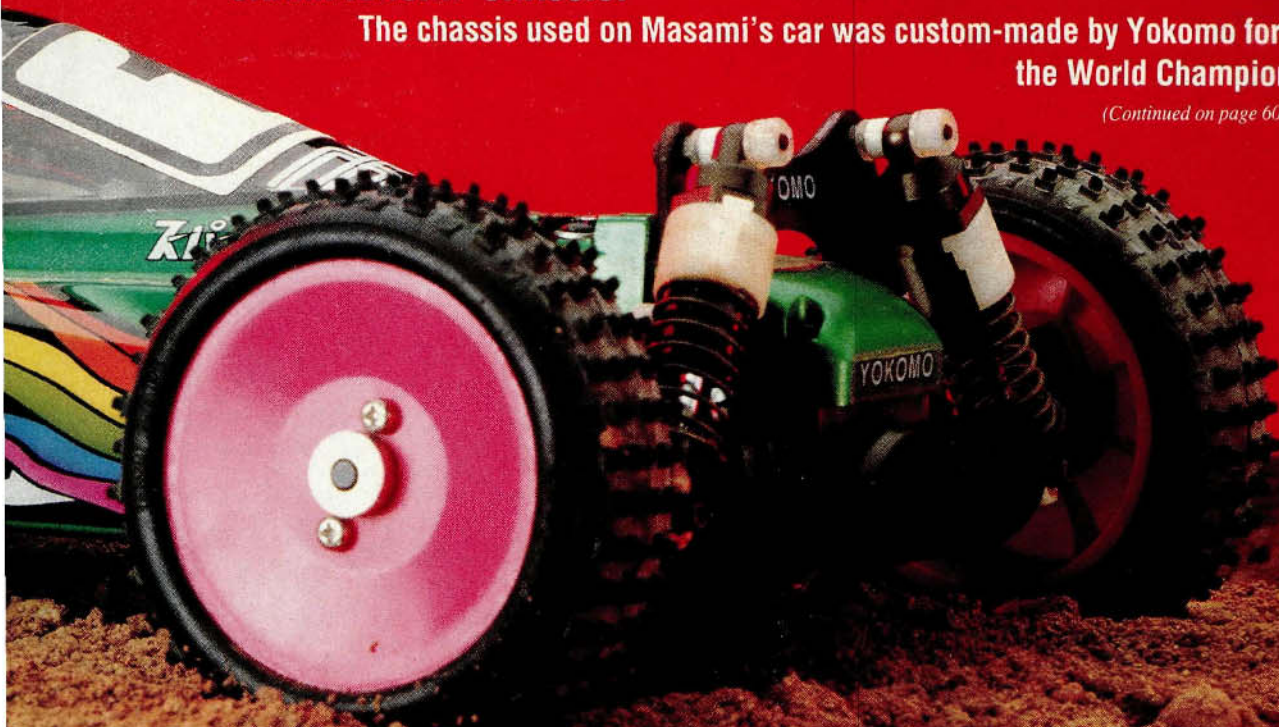


Left to right: Masami's father, Masaaki, Masami and Yokomo owner, Tom Yokobori, celebrating Masami's win at the 4WD World Championships.

CHAMPIONSHIP CHASSIS!

The chassis used on Masami's car was custom-made by Yokomo for the World Champion-

(Continued on page 60)



MASAMI'S YOKOMO

1 RCPS Titanium Ti-Rods replace the stock rods everywhere.

2 Yokomo molded-plastic steering blocks replace the stock magnesium ones.

3 To strengthen the steering hardware, Masami uses a Yokomo steering brace.

4 Custom-made chassis by Yokomo.

5 For faster steering response and increased torque, a KO Propo (no. PS-87FET) FET-boosted servo is used.

20 RCPS Titanium hinge pins are used in place of the stock ones.

19 Modified Yokomo shock towers are used in the front and the rear.

18 For a wider stance, rear A-arms are used in front.

16 Yokomo's special chassis stiffener is used in place of the stock one. The inscription is Masami's name.

17 Mounted on 2.2-inch rims are TR-32 tires for the front and TR-31 tires for the rear.

6 A set of six, Reedy, matched SCE cells is used for power.

7 The body and undertray from the older Dogfighter is used. Note the lead tape that increases the car's weight.

8 For precise control, KO Propo's CX-III speed controller was used.

9 A set of longer, custom-machined, rear A-arms replace the stock rear A-arms.

10 Yokomo gear adapter (part no. ZC641G) with double one-way bearings.

11 A modified rear bulkhead and orange Kevlar rear belt are used.

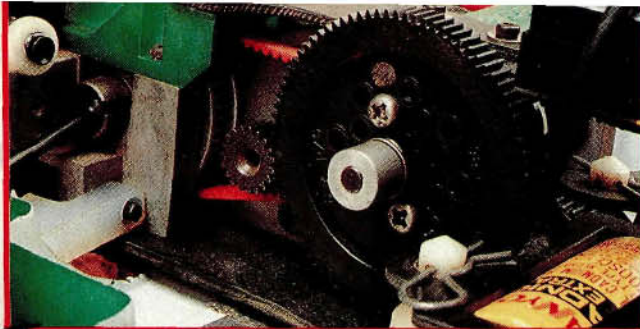
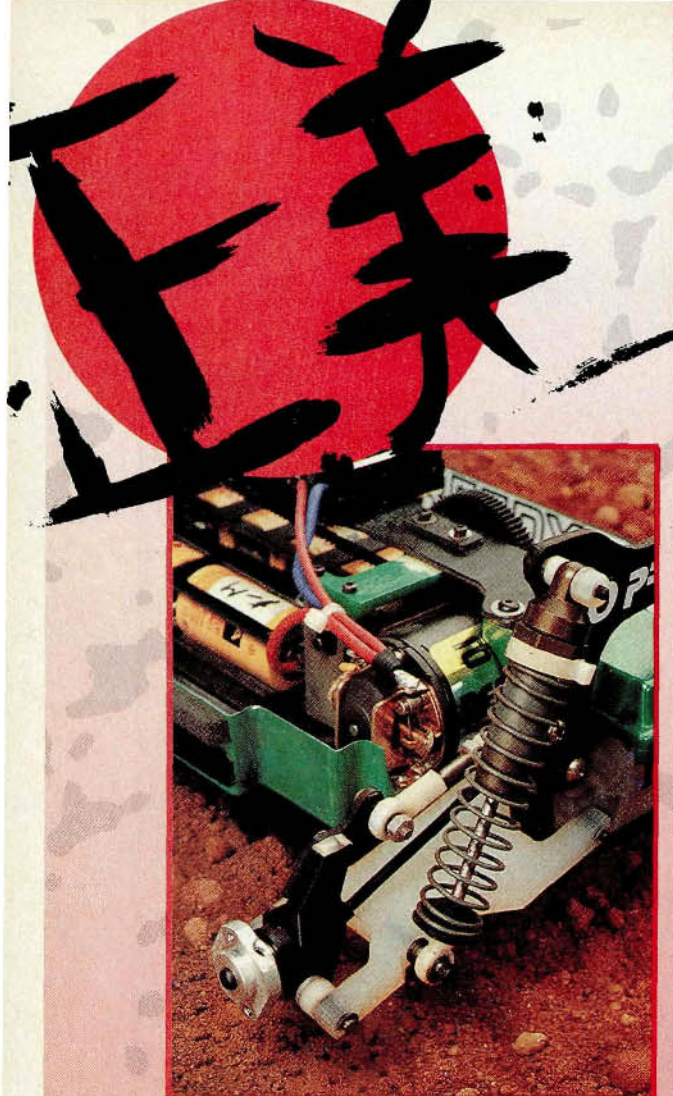
14 Machined front and rear diff pulleys are used in place of the stock nylon ones.

15 A lightweight receiver cover is used.

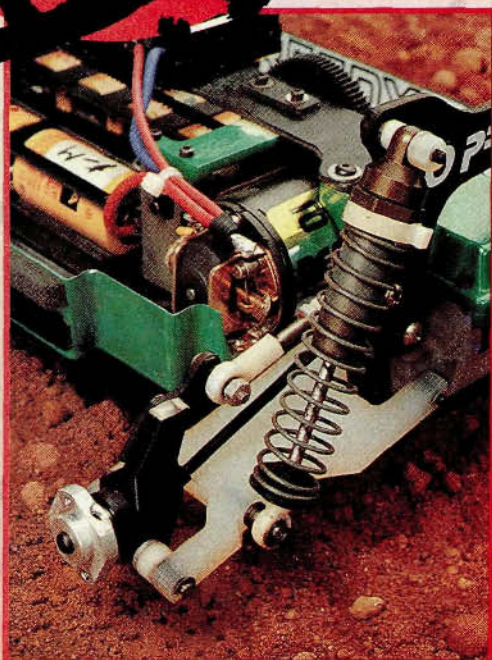
13 A Reedy 14T double motor is used to power Masami's Yokomo.

12 Hard, anodized, Associated shocks replace the stock shocks.





A Yokomo spur-gear adapter with two one-way bearings was used. The orange rear belt is made of Kevlar, and is lighter and more stretch-resistant.



To damp the bumps of the rough St. Ives track, Masami used a full set of Associated's shock absorbers. Unlike the Gold ones, these have been hard-anodized.

ships. It's made of the graphite we're all accustomed to seeing, but it has an odd battery configuration. The battery slots were cut to keep the batteries as close to the chassis' center as possible, and when combined with the car's other components, they provide perfect balance. By moving the batteries closer to the center of the car, you create, in technical terms, a "low-polar moment of inertia." This means that the car can recover more quickly when it's rolling from side to side.

Try thinking of the concept like this: take a barbell and place an equal amount of weight at the ends; place your hands close together on the bar's center, and try to rock it like a see-saw. Then move the weights to the center of the bar between your hands and try the same thing. With the weight on the ends of the bar, it's hard to get it moving, and it's very tough to

stop. With the weight in the center (like the batteries in the center of the car), it's easy to get it moving, and it's also much easier to stop. The battery arrangement works the same way and it helps the car to recover quickly from rolls.

Masami's car also features a Yokomo graphite upper plate to add rigidity. (The characters cut in the front of the upper plate mean "Masami.")

SUSPENSEFUL SUSPENSION!

The car's suspension is quite a departure from the kit's original equipment. Starting in the rear, the two custom-made, natural-nylon suspension arms are longer than the stock arms. Attached to the end of each arm is an RC10 hub that was modified for use on the Yokomo (see picture). The longer arm doesn't make the car wider; rather, it was designed to allow the use of the RC10 hubs (there's also more toe-in), and to limit the amount of tire scrub when the suspension is compressed or extended.

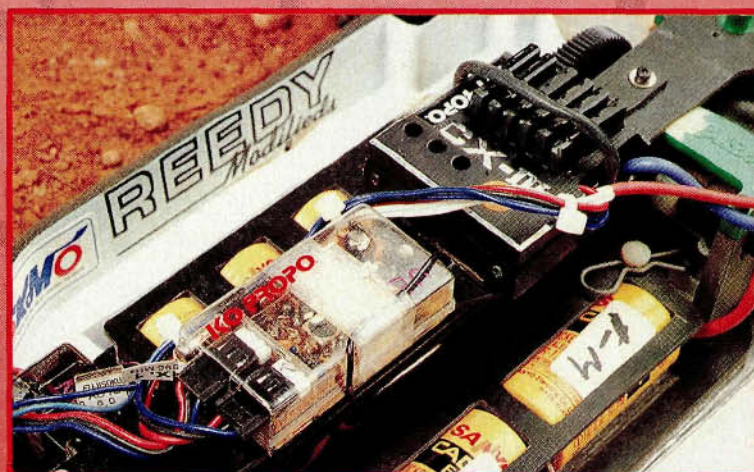
Tire scrub is most apparent when the suspension extends. When the suspension arms pivot downward, their ends follow an arc that moves closer to the car's center. When the car is hanging in the air, you'll notice that its overall

width is less. When it comes back down, its arms move upward, and as they approach the point where they're parallel, the suspension is at its widest. The longer the suspension arm, the less the tire scrub.

The longer rear-suspension arms are used on the car's front suspension. (These arms also minimize tire scrub.) A wide front-end kit was used to keep the front track at the same width and move the tire inward over the kingpin. By centering the tire over the kingpin, the steering response is much quicker. Standard Yokomo hub carriers were used with a pair of molded-plastic steering hubs to replace the kit's fragile magnesium hubs. The suspension's upper links and tie-rods are titanium turnbuckles from RCPS*.

The damping on the car's four corners is handled by four Associated hard-anodized shocks that allow the piston to move up and down in the chamber with much less resistance. Associated 30WT silicone oil is used all around, as is a set of Green Springs. The Green Springs are the softest in the Associated line, and they were used to provide the best traction on the hard-packed surface at St. Ives.

The drive train of Masami's car is similar to that on a stock Super Dogfighter (known as the YZ-10 in the U.S.), but there are a few subtle



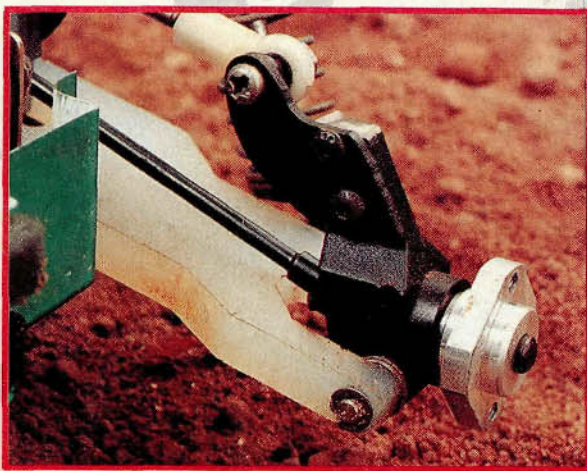
A KO Propo radio and a KO CX-III speed controller are used. To reduce the weight, Masami replaced the receiver's stock cover with a polycarbonate one. (Note the cells on the right: they're arranged front-to-back.)

differences. Instead of the stock spur gear and a single one-way bearing for powering the front wheels, Masami used a Yokomo-

made aluminum spur gear adapter that has two one-way bearings (for increased durability and to facilitate the use of any standard spur gear). A standard belt drives the front differential, while an orange Kevlar belt drives the rear. Masami used the Kevlar belt because he thinks it's lighter and creates less drag. The difference between the belts is actually slight, so it may be just a matter of preference. The differentials have aluminum pulleys that we originally thought were a "trick" part, but there's a good reason for them: Masami likes to run his car with a slight front-end overdrive. "Overdrive" means that the front wheels will spin slightly faster than the rear wheels, and this pulls the car through turns. Yokomo didn't make any pulleys to alter the front-to-rear drive ratios, so Masami machined a pair out of aluminum.

SHOCKING ELECTRONICS!

This car's electronics consist of KO Propo* radio gear and Reedy motors and batteries. The radio is a two-stick model from KO (model no. not available). A CX-III electronic speed controller, a 2-channel receiver and an FET-booster steering servo were installed. To further power the servo, Masami also added two more cells, (much smaller than the sub-Cs), which are installed in-line with the FET booster for the steering servo. Because the steering servo is FET-boostered, it's already running off the 7.2 volts of the 6-cell pack that powers the car. The



This set of longer, custom rear nylon arms was made to accommodate the RC10 rear hubs.

extra cells for the servo increase its power to 9.6 volts. The steering in Masami's car is lightning-fast!

The Reedy Modified motor's battery/motor combination is obviously a winner. The cells come directly from Reedy's cell-testing equipment, and although we don't have any numbers on them, you can bet that they're the best you could find. To complete the power combination, a 14-turn double wind was used. I don't know what the motor's wire gauge is, so I can't tell you if it's a Gold Star motor or not, but it certainly boogies!

"ATTRACTIVE" TIRES!

Hanging on the end of the suspension components are the famous Yokomo 2.2-inch

rims and tires. The rims, legal by IFMAR rules, serve as a saddle to the TR-31 rear and TR-32 front tires that were considered (at least by the drivers who ate Masami's dust!) a big advantage. Notice that the outside row of spikes on the front tires has been cut off. This reduces traction and steering and makes the car more stable through turns.

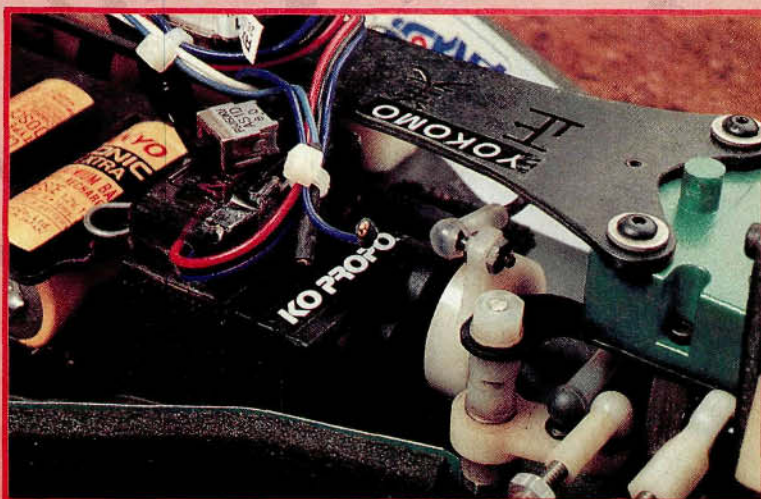
BODY BEAUTIFUL!

Masami's final touch was to add

the original Dogfighter body. After some "trick" paint by a custom painter, Masami added what looked like lead tape to the bottom of the chassis to bring the car up to the legal weight, yet still keep its weight as low as possible.

If you intend to make your YZ-10 or Super Dogfighter into a Masami replica, beware! I was cautioned by Associated team driver Cliff Lett that this car is a combination of modifications that work well together but may not work well separately. Nevertheless, some of the mods could be a sound foundation for your car, and some of the parts are already available, with others on the way! Some will *never* be here, but if you're as creative as Masami, that

Below: On top of the steering servo is an FET booster that increases the servo's speed and power. The upper chassis stiffener is inscribed with Masami's name, and the steering hardware has been modified with a custom-graphite brace to support the pivots.



won't stop you!

Our thanks go to Masami and Team Associated for giving us the opportunity to show the rest of the R/C racing world how it's done by a World Champ! Now, everyone who wants to see the 2WD winner, raise your hand...!

**Here are the addresses of the companies mentioned in this article:
Associated/Yokomo/Reedy, 3585 Cadillac Ave., Costa Mesa, CA 92626.
RC Performance Specialties, 18312, Gifford St., Fountain Valley, CA 92708.
KO Propo; distributed by Global Hobby, 10725 Ellis Ave., Fountain Valley, CA 92728.*

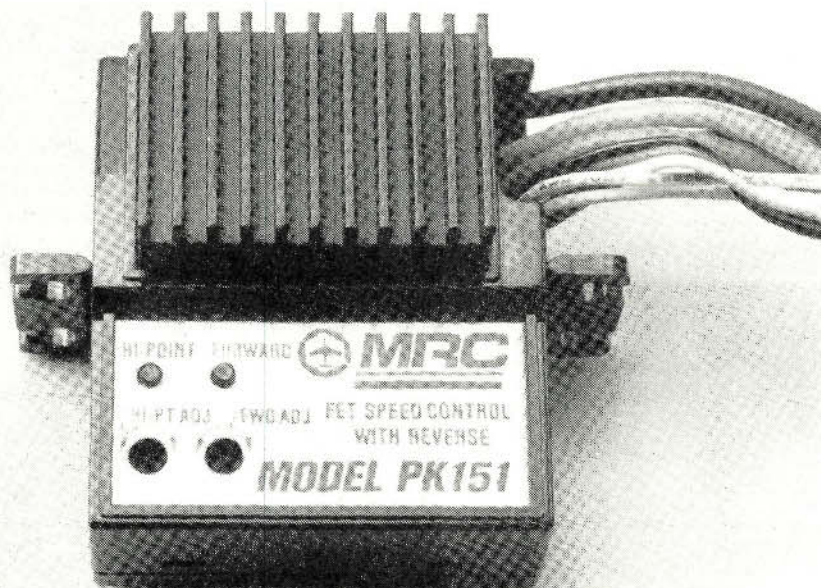
SCOPING OUT

by JOHN RIST

MRC PK151

MY GOOD FRIEND Al Glenn spotted Kyosho's new Formula 1 car kit in the hobby shop, liked its body's scale-like appearance and decided it would make a really good project. Al was even more excited when he discovered that the car's suspension was also scale-like: inboard shocks with tension rods going outward to the ball-joint assembly can't be found in the standard pan-car chassis that's used for most Formula 1 projects.

Al asked me which electronic speed controller he should use, saying that it had to have reverse because Formula 1 rules specify it! MRC's* PK151—a reversing speed controller—had just showed up on my front porch ready to take its chances on the "Scoping Out" test bench. I told Al that he could have the PK151 for his Ferrari as long as I could drive his new creation for this month's road test. With



PHOTOS BY JOHN RIST

MRC's PK151 is a reversing electronic speed controller that's designed to replace a throttle servo.

this all worked out, Al went off to build the car, and I headed to the lab to put the PK151 through its paces.

The PK151 has these features:

- variable forward with brakes and single-speed reverse
- reverse has built-in delay to prevent gear damage
- 12 FETs: eight for forward; four for reverse
- a built-in pulse checker
- two adjustment pots: one for neutral and one for full speed
- a built-in heat sink
- a Tamiya-style battery connector and bullet-style motor connectors
- an instruction sheet

I always take the case off a new speed controller, and with the PK151, this was easy, because the case is made of molded plastic halves that simply snap together. I only recommend that you open a speed controller if you're used to working with miniature electronics, but this one opens easily, so, if you wanted to, you could open it occasionally to dump out any sand and dirt that has built up inside. The case also has servo-style mounting "ears" on each side, so it should be easy to mount it in place of the throttle servo it's intended to replace. If space is limited, you can break off the "ears" and mount the PK151

THE "SCOPING OUT" LAB

John Rist's lab consists of:

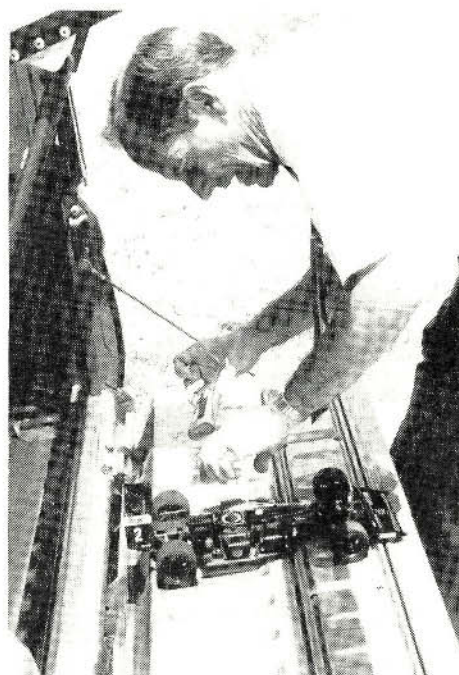
- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V 30-amp electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5-watt power resistors, which can be switched on and off one at a time to vary the load between .6 amps and 20 amps.

In series with the resistors is a 25-amp Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.



The PK151 became very hot during our test runs—that hot Alabama sun heated everything, and Al burned his fingers removing the battery pack.

with servo tape.

The PK151's construction is quite conventional, and the parts and workmanship looked good—but just *looking* good isn't enough! Did this controller have enough punch to improve the performance of your

(Continued on page 64)

SCOPING OUT

prize vehicle? I tested it in the "Scoping Out" lab, in which I use a Pit Stop Radio to operate it so that I don't have to fight a spring-loaded transmitter trigger.

MRC PK151

DIMENSIONS:

Height	1.10 inches
Width	1.59 inches
Length	1.81 inches
Weight with wires	2.7 ounces

TUNING:

Access to Controls	Fair
Ease of Adjustment	Good

PRICE:

Suggested Retail	\$70
Warranty	None

ELECTRICAL:

(Manufacturer's Specs)

Max Voltage	8.4 volts
Min Voltage	7.2 volts
Max Current	320 amps
Continuous Current	80 amps
Resistance	Not stated

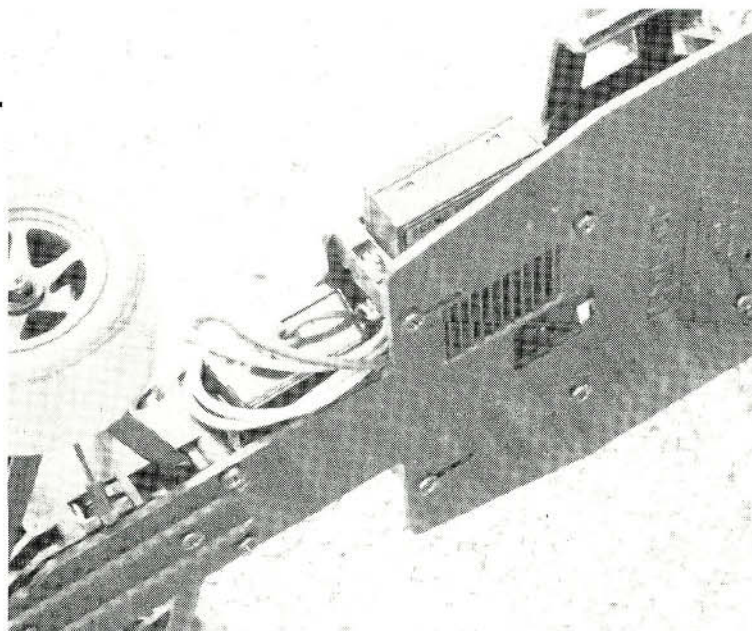
TEST PARAMETERS:

Voltage	6 volts
Current	12 amps
Voltage Drop (wires & connectors*)	0.57 volt
Voltage Drop (2-inch wire point*)	0.39 volt
Resistance to end of wires	0.0475 ohm
Resistance (2-inch wire point)	0.0325 ohm
BEC Output (6-cell battery)	5.79 volts

*Resistance = Voltage Drop/Current

COMMENTS:

The PK151 got hot in the lab test and the road test, but this was because the weather was very hot! It survived this abuse. The adjustment pots aren't aligned with the case, so it was difficult to insert a screwdriver, but the built-in pulse checker is very accurate. A speed controller with reverse adds realism to a scale project. Looking for an affordable reversing electronic SC? The PK151 could be just the ticket.



A hole was cut in the bottom of the Ferrari's chassis to allow more cooling air to reach the PK151.

LAB TESTS

When testing any SC, I first get it to work on my test bench, and I always read the instruction sheet before I install it, because I don't want any surprises when I turn it on for the first time. The PK151's instruction sheet is skimpy—just a strip of paper printed on both sides. There's only one diagram—a drawing of the SC—and any first-time user would surely appreciate a picture showing how the controller should be connected to the car's other components. There's no mention of any kind of warranty. The few instructions provided are good, however, and they give enough information to set up the controller properly.

My only other problem with setting up this controller arose because the adjustment pots were poorly aligned with the holes in the case. This made it difficult to get a screwdriver into the slot. According to my oscilloscope, the built-in, pulse-checker LED worked well. With the PK151 all set up and running, it was time to start the tests.

An SC's most important parameter is its "on" resistance. A high "on" resistance robs the motor of power and wastes a lot of battery energy in the form of heat. For comparison, I always measure the resistance twice:

—first, from connector to connector, to determine the resistance of a box-stock controller

—second, at the 2-inch point on the wires.

With 12 amps flowing, the connector-to-connector voltage drop was .57 volt, which works out as a resistance of .0475

ohm. At the 2-inch point on the battery and motor wires, the voltage-drop reading was .39 volt—a resistance of .0325 ohm. This is, of course, higher than the voltage drop found in most forward-only, racing-style SCs. Reversing controllers have a higher resistance because they use



Why is Al smiling? Not only did the PK151 survive the tests, but his Ferrari was also still in mint condition after he had allowed hammer-handed hot-rodders a chance to drive.

four of the 12 FETs for reverse and use the remaining eight in two groups of four, which are then placed in series. If you want reverse, you have to pay for it with reduced performance.

How would the PK151 withstand my "let-it-cook" test? I readjusted the resistor load bank until the ammeter indicated 15 amps, and I let the controller run for

10 minutes without any cooling. After this, the controller was still operating normally, but it was *really* hot. Considering the connector-to-connector .57 voltage drop, this wasn't too surprising. If you use a PK151, mount it so that it gets plenty of air.

My final test simulates a shorted motor or a seized gearbox. I had built a killer shorting device by soldering two alligator clips to each end of a length of monster wire, and I put it across the controller's motor leads. The current jumped up to 45 amps, and I left the wire in place for 15 seconds. By then, the PK151 was smoking! I removed the short, and the controller was still working, so I shorted it twice more—each time, for 10 seconds. The PK151 survived, but it was *hot!* When you run an electronic SC, you're playing with a fairly large investment, so you should let off the throttle when there's a problem. A little common sense can save a lot of heartache—and expense!

CAR TESTS

As agreed, Al installed the PK151 in his 1/10-scale Ferrari, and I warned him that it needed plenty of cooling. He found that the scale appearance of his Formula 1 car didn't allow much room for mounting the components. The only hole big enough for the controller was the space left when the throttle servo was removed. This turned out to be a good place, because it's near the front of the car where the air flow is good.

To increase cooling, Al also cut a hole in the bottom of the car to expose the top of the heat sink to the air moving under the car. As you'll see in the picture, the PK151 fit, but the heat sink was turned 90 degrees away from the position that would have given maximum cooling. Space was so tight that this was the best we could do with a controller of this size. We decided to give it a shot and see if the controller survived. After all, not all installations are ideal.

With the car, a battery pack and a camera, we headed to the paved parking lot behind the company where we work—our *real* work, that is! Kyosho's Ferrari is a

real crowd pleaser, and we soon had a dozen people watching us drive this beauty. Its gleaming red paint job and its slight over-steer made it look like the full-size car as it screamed across the tarmac.

We were having so much fun that I almost forgot that I was testing a speed controller—but the controller was taking care of itself very nicely! Its acceleration was crisp; its forward throttle response was smooth and controllable; its brakes were strong enough to force high-speed spin-outs. The only thing that was a little unrealistic for a scale project was reverse. In this SC, it's a single-speed reverse that kicks in after a small delay—a design that prevents gear-stripping jolts when shifting from forward. Although this setup isn't totally realistic, it does protect your gearbox. At the end of a high-speed run, which lasted approximately 7 to 8 minutes, I quickly picked up the car to check the temperature of its components.

Everything was *hot!* The battery, motor and speed controller were all too hot to touch. This was partly the result of running the car under the Alabama sun on a day when air temperature was 94 degrees and pavement temperature well above 100 degrees. Just how hot was it? Look at Al's face in the picture where he's removing the battery from the car. Burnt fingers hurt! The components—including the PK151—survived! The big smile on Al's face sums it all up. We all had fun—and there wasn't a scratch on Al's Ferrari!

The PK151 isn't intended for racing, but in a stock class on a short course that doesn't require raw speed to win, it might do well. It *will* work well as an inexpensive replacement for a pesky burnt-out mechanical speed controller—the fried mess that's routinely found in backyard-uggies! Perhaps this is just what you need to blow the doors off the other yard-burners in your neighborhood. Al demonstrated that the PK151 also works well in a scale project where reverse and smoothness are important.

**Here's the address of the company featured in this article:*
MRC, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

Stormer Racing

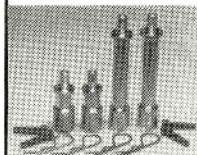


KING CAB OWNERS



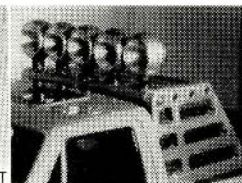
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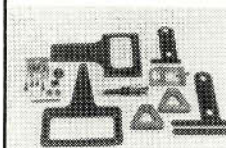
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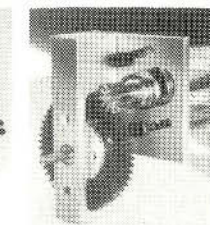
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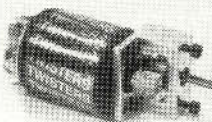
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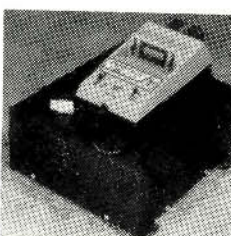
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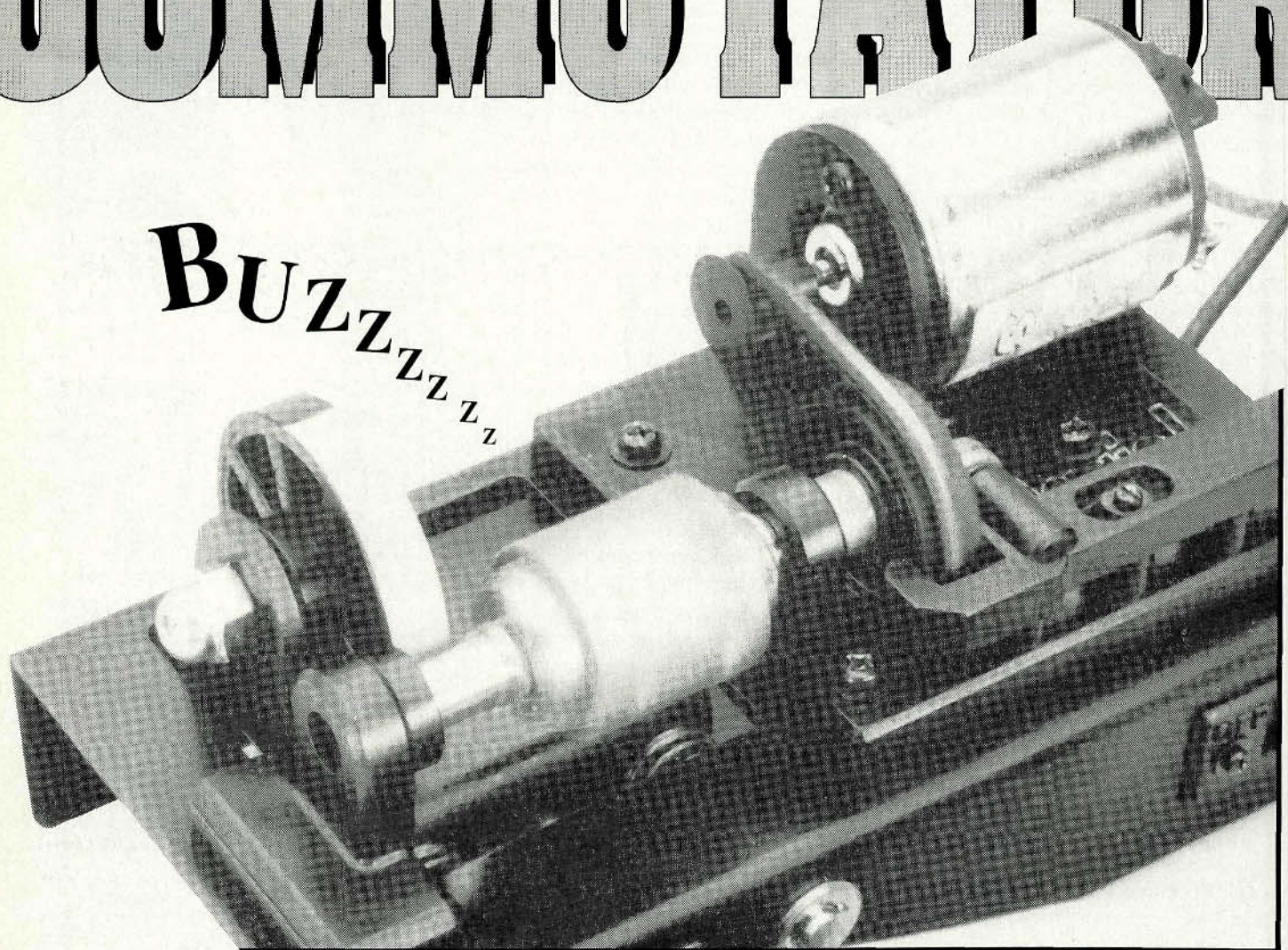
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COMMUTATOR

BUZZZZZZ



PHOTO'S BY YAMIL SUEDE

by JIM DAHL

HERE'S ANOTHER piece of new equipment for your R/C workshop—Trinity's* new Magic Motorsports Commutator Machine for maintaining commutators on modified motors. If you run modified motors in competition or just for fun, this small, light machine will maximize motor performance, extend armature life and enable your motor to run more consistently. It also comes in a sturdy box that's easy to transport to a race.

There are other reasons to run modified motors beyond the thrill of maximum power: you won't have to endure the controversy about stock motors, and even though modified motors are more expensive than stock, they should last longer.

In motors, the ball bearings and the armature/commutator are the two components that are most likely to need maintenance or replacing. In stock motors, no matter how careful you are, the bushings will wear out—even the long-lasting steel type. The commutator in a stock motor wears out

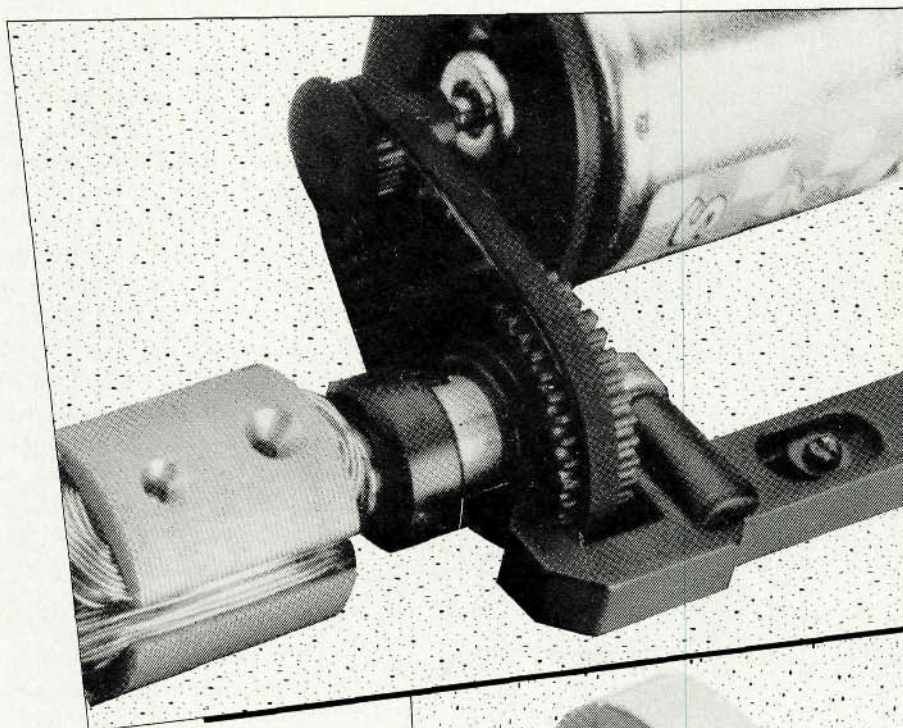
rapidly, and although there are ways to clean and polish it, it can't be dressed while it's in the car. (Of course, it's illegal to take a stock motor apart in a sanctioned race.)

It's very important to clean all motors frequently. The commutator must also be maintained, i.e., the copper surface must be concentric (a perfect circle around the same center line as the shaft), and it should have no burn marks. Current is reduced if it passes through dark, burned spots, and because these spots wear more rapidly than the rest of the commutator, high and low spots soon appear. Brushes can't stay in contact with the commutator when the surface isn't smooth and even.

The 18-step instruction sheet with corresponding photos shows you how to assemble and use this machine. Trinity makes it clear that it's for the proper truing of a new or well-maintained commutator; it isn't intended to be used as a re-grinding machine. To get the most from your motors, you could use the Magic Machine every two to three runs. (Send

MACHINE

**GRIND, SHINE and POLISH-then
DEMOLISH... the competition**



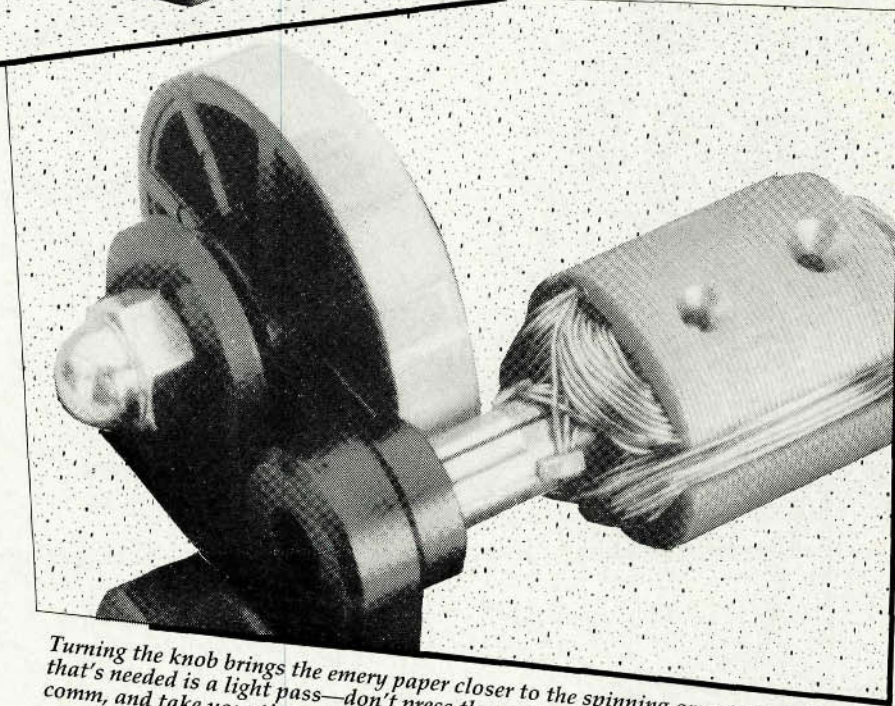
The drive motor spins the armature via a belt drive. Because of the gearing, the armature spins only about one third as fast as the driving motor.

armatures that need reconditioning to Trinity or to other companies that offer motor-rebuilding services.)

Assembly is straightforward, and all parts are sturdy and well designed. The "grinding wheel," which consists of fine, adhesive-backed emery paper on a plastic wheel, is true and concentric. The wheel rides in a one-way bearing to prevent it from spinning freely while the armature is being ground. The armature also rides in two ball bearings—a nice feature that increases the life of the machine.

The drive motor shown in the photos is a Speedworks Super Speedway* stock and the battery is a 6-cell stick pack.

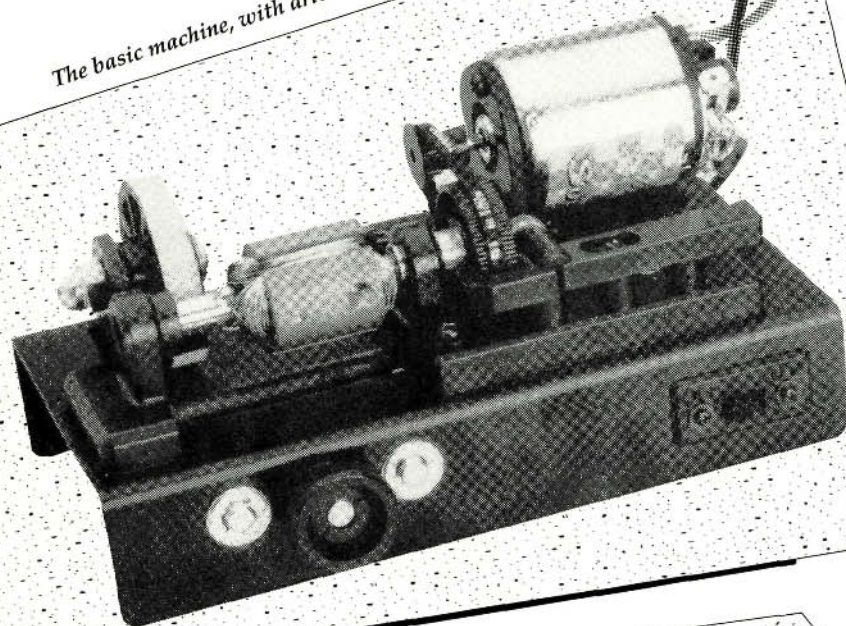
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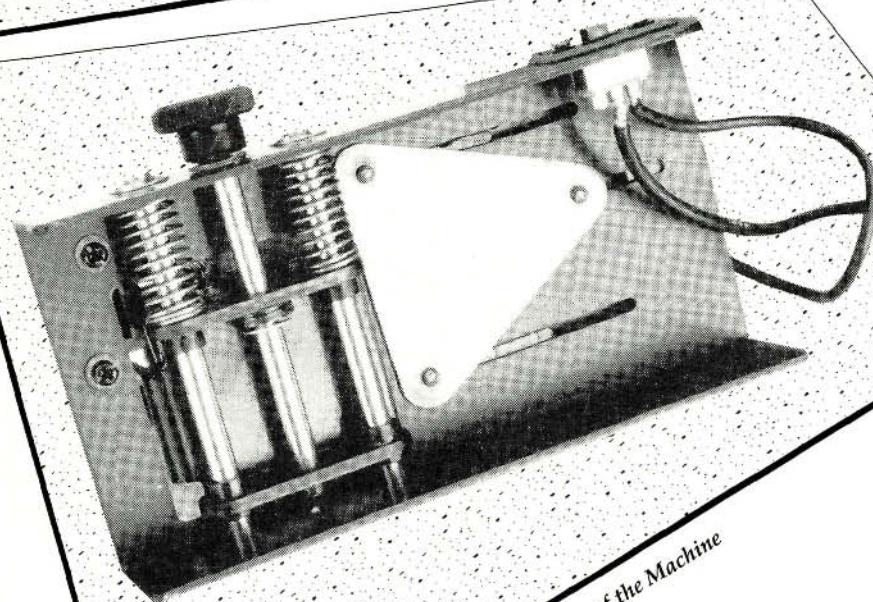
Turning the knob brings the emery paper closer to the spinning armature. All that's needed is a light pass—don't press the emery paper too hard against the comm, and take your time.

COMMUTATOR MACHINE

The basic machine, with driving motor, battery and armature.



The Underside of the Machine



Although you could use any 540 motor or power source, it's better to avoid excessive rpm. A more powerful motor won't do a better job or finish any faster.

Once you've assembled the unit and the armature is ready to be ground, be sure to follow the last section of the instructions carefully! Have a gentle touch. Start with the grinding wheel slightly away from the commutator, and move it inward very slowly. When the emery paper is clogged with copper, replace it. (It's available from Trinity.)

Turn off the machine frequently, and check the commutator's surface. Remove only enough material to ensure that it's clean and concentric. This is easily done by using the emery paper provided and very lightly sanding the commutator in a longitudinal direction (parallel to the armature shaft). When the grinding wheel has dressed the commutator's entire surface, the scratches will have disappeared. These longitudinal scratches are used as a visual aid, and once they've been ground off, you're done. Don't color your commutator with magic marker—it clogs the emery paper too quickly when you grind it off.

This new machine from Trinity does what it's supposed to do and does it well. It should last a long time. You can't maintain modified motors without taking care of their commutators. At the big races, this maintenance procedure is performed after every run! You can share the \$149.95 cost of this Magic Machine with some friends, or add it to your own collection. Either way, you'll be pleased with the results and save money in the long run.

**Here's the address of the company featured in this article:*

Trinity, 1901 E. Linden Ave. #8, Linden, NJ 07036.

Speedworks Super Speedway/Trinity

by ALEX STROUTHOPOULOS

THE YOKOMO* YZ-10 is very versatile. In its stock form, it's a lethal off-road buggy and the winner of national and world titles. No one can dispute that it's the "big boy" on the block. As an oval car it has also done well: as a monster truck...well, we'll find out!

As the base, I used a JG* Total Monster Truck conversion kit and my battered YZ-10 to make the "all-supreme" truck! (Ha...ha...ahem!) With the kit's colorful box in my lap, I was curious to see



PHOTO BY JOHN HUNTER

Monster Masami Mobile

JG YZ-10

C O N V E R S I O N

which parts were waiting to meld with my YZ, and I was surprised to find that the Ford body filled most of the box. One large bag





contained the rims, and a few smaller bags held the body posts, body foams (a nice touch) and the front and rear body mounts.

I was shocked!—so little to convert the car into a truck! Simplicity itself!

AN EASY CONVERT?

It was time to take out the tools and make this car into a killer! If the YZ has a weakness, it's the front end. I had already broken four stock front A-arms and one hub carrier, so I replaced them with a pair

of specially CNC machined aluminum A-arms (sent to us by one of our readers). I've used these for five months without any problems.

Monster Trucks take a beating, so they must be beefed-up. I replaced the stock front bulkhead with one from RPM* that's guaranteed indestructible! It tilts the suspension pins backward 10 degrees further for a total of 30 degrees of caster. To reinforce the bulkhead and stiffen the chassis, I attached a Jammin' Jay's* chassis stiffener to the front and rear bulkheads. This

weaknesses become apparent. I replaced it with the Magic Motorsports* aluminum-steering kit with bearings and I replaced the Yokomo shocks with sets from Associated*—short for the front and long for the rear. To achieve the “wild” gear ratios that trucks need to move their big tires, I added an

SRM* gear adapter. Finally, I replaced the front magnesium knuckles with nylon ones from CRM*.

With the modifications complete, it was time to install the truck kit: I attached the body mounts to the front



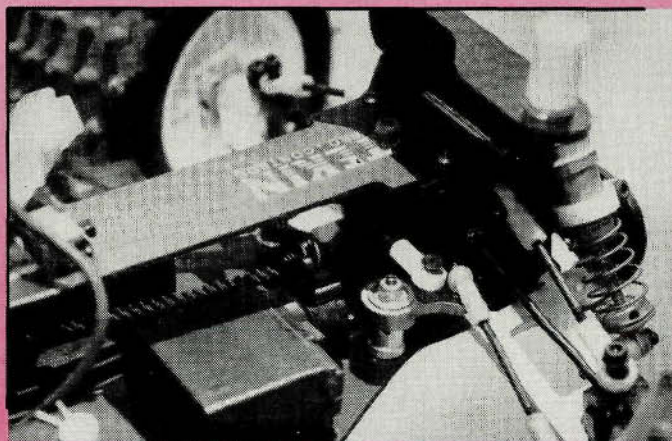
Alex says, “To get those wild shots, it's important that things are kept running well during the photo session.”

stiffens the chassis and protects the front bulkhead and shock tower. I moved the belt tensioner to the stiffener's underside, and this made room for the speed controller in the usually cramped stock chassis.

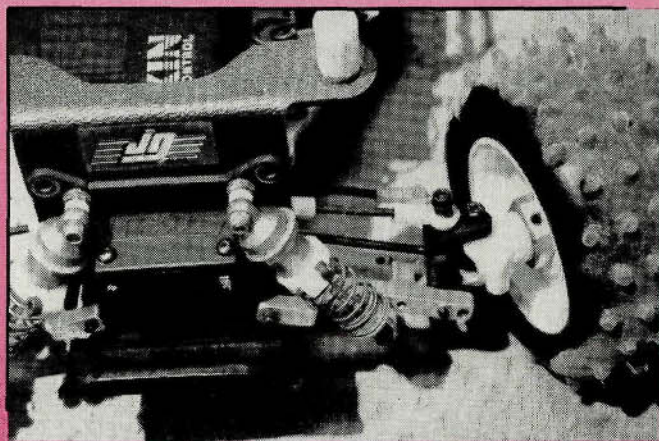
When the big tires bounce around, the stock-steering arrangement's

and rear shock towers; bolted the tires directly onto the wheels (no adapters needed!); and I masked and primed the body—quick, simple and painless!

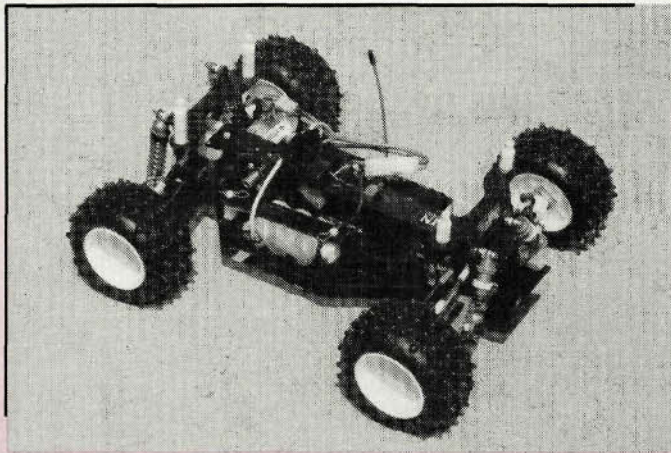
As usual, I installed my Airtronics* receiver and servo—both have been to hell and back, but they still work perfectly! I chose the new Tekin* 411P speed



You can see the Magic Motorsports aluminum steering kit with ball bearings, the Associated short shocks and the “rods of doom.” (I had problems with these rods; see text.)



The Associated front shocks were a billion times better than the waste-of-good-metal Yokomo shocks. I kept the stock front bumper for safety.



The equipment is ready to go—and it will go, but not for long! The Jammin' Jay's chassis stiffener adds the necessary space for the oversize but incredible Tekin 411P.

only inched ahead slowly—the diffs were too loose. ("Lock 'em up!" said

Commander Pond.)

The next assault would be the one that counted! I buried the throttle, and the truck took off like a rocket, blazed around the track and spit dirt everywhere—I loved it! It was fast, handled well, flew off jumps and landed with the grace of a brick! (Yep, a brick!) The flight was straight, but the touchdown was inadequate, so I knew I had to let off the throttle before the jumps.

This abuse was too much for the truck and, eventually, a rod end broke. The Magic Motorsports Steering kit doesn't come with the necessary hardware to make a winning steering arrangement, and I had to improvise the repairs because the stock kit didn't have the proper rods and rod ends.

With the steering fixed, it was time for more action, and Commander Pond wanted to try the controls. After a few bumps and berms, Pond opened the throttle over a double jump. The car soared into the outer barrier and its left

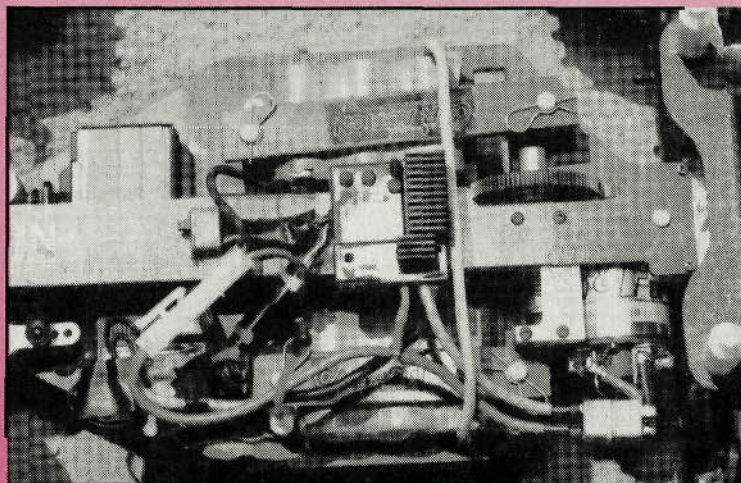
(Continued on page 186)

controller because of its high frequency, which gives a more progressive throttle and longer-lasting motors. It's also "regenerative," so when the brakes are applied, current flows back to the battery! An in-car charger—cool! For the motivation, I chose a B&R* 15 double for its all around efficiency, and Bullet Enterprises* battery packs provided the juice.

Finally, I masked the Ford body and spray painted it with Pactra* Indy Silver, Fluorescent Neon Red and Pearl Purple. I added decals and a few details with a Sharpie marker. It was time to rock the house with this bad boy hybrid!

TOUGH TRUCK TEST!

My first chance to test the truck was at the photo shoot, so I naturally checked everything carefully beforehand. The 6-cell battery was charged, the transmitter was loaded with fresh batteries, and all the connectors were connected. I nailed the throttle! The motor blazed at full force, but the truck



A Tekin 411, a B&R 15 double and an Airtronics radio supply the super-go guts.



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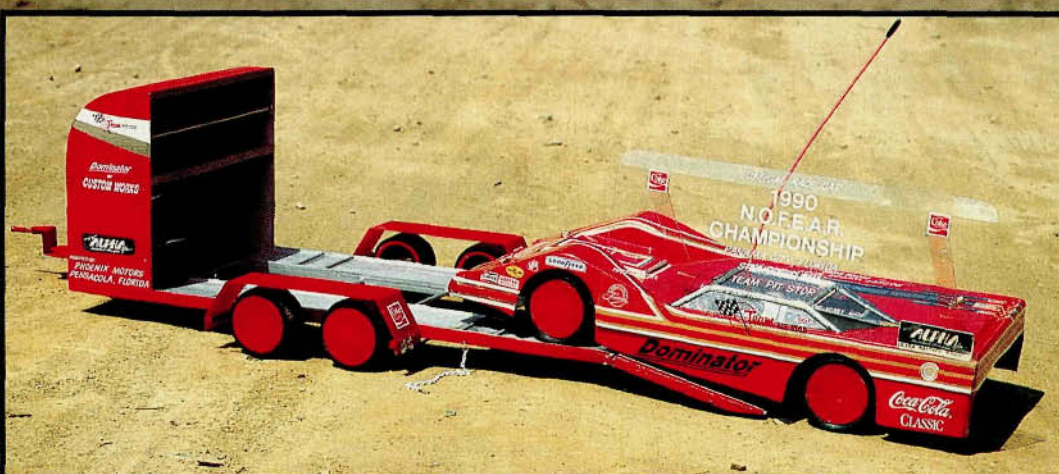
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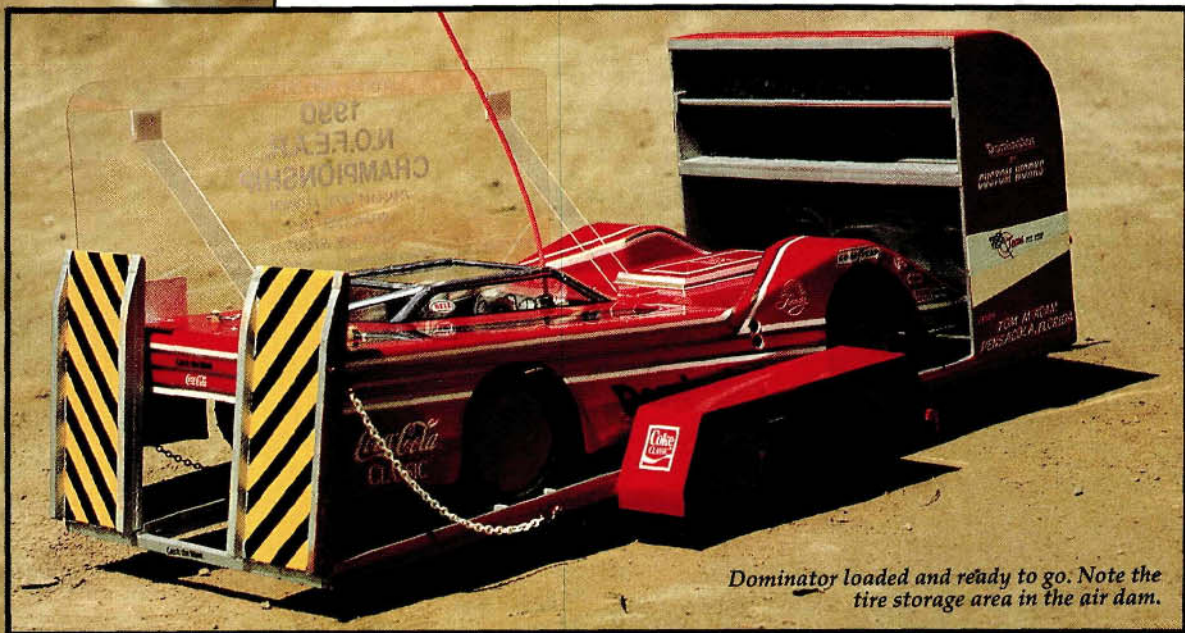
HOME-BUILT PROJECT:

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Fold-down ramps, secured with chains for travel, make loading the Dominator a breeze.

PHOTOS BY YAMIL SUED



Dominator loaded and ready to go. Note the tire storage area in the air dam.

YOU MAY HAVE noticed a recent trend with the full-scale tractor-trailer rigs. In an attempt to reduce drag and conserve fuel, wind deflectors have been mounted on the cab roofs. On a cross-country haul, these deflectors can reduce fuel costs considerably. Thomas McAdam of Pensacola, FL, incorporated this design on his streamlined custom trailer, which appeared in the "Readers' Rides" section of the June '90 issue.

After reading Jim Shepka's article entitled "Low-Dollar Custom Trailer" in the December '89 issue of *Car Action*, Tom decided to build a trailer for his Dominator. Most of his modifications were made to the air-dam/tire-storage unit.

Basically, the Custom Works* Dominator is built in its stock configuration and powered by a Phoenix 12-turn double motor and a Novak* NESC T-4 speed controller. For the radio, Tom chose a Futaba* micro receiver with the very small and fast 132 S servo. Seven Alpha SCE cells give him all the power he needs to be very competitive at his local track.

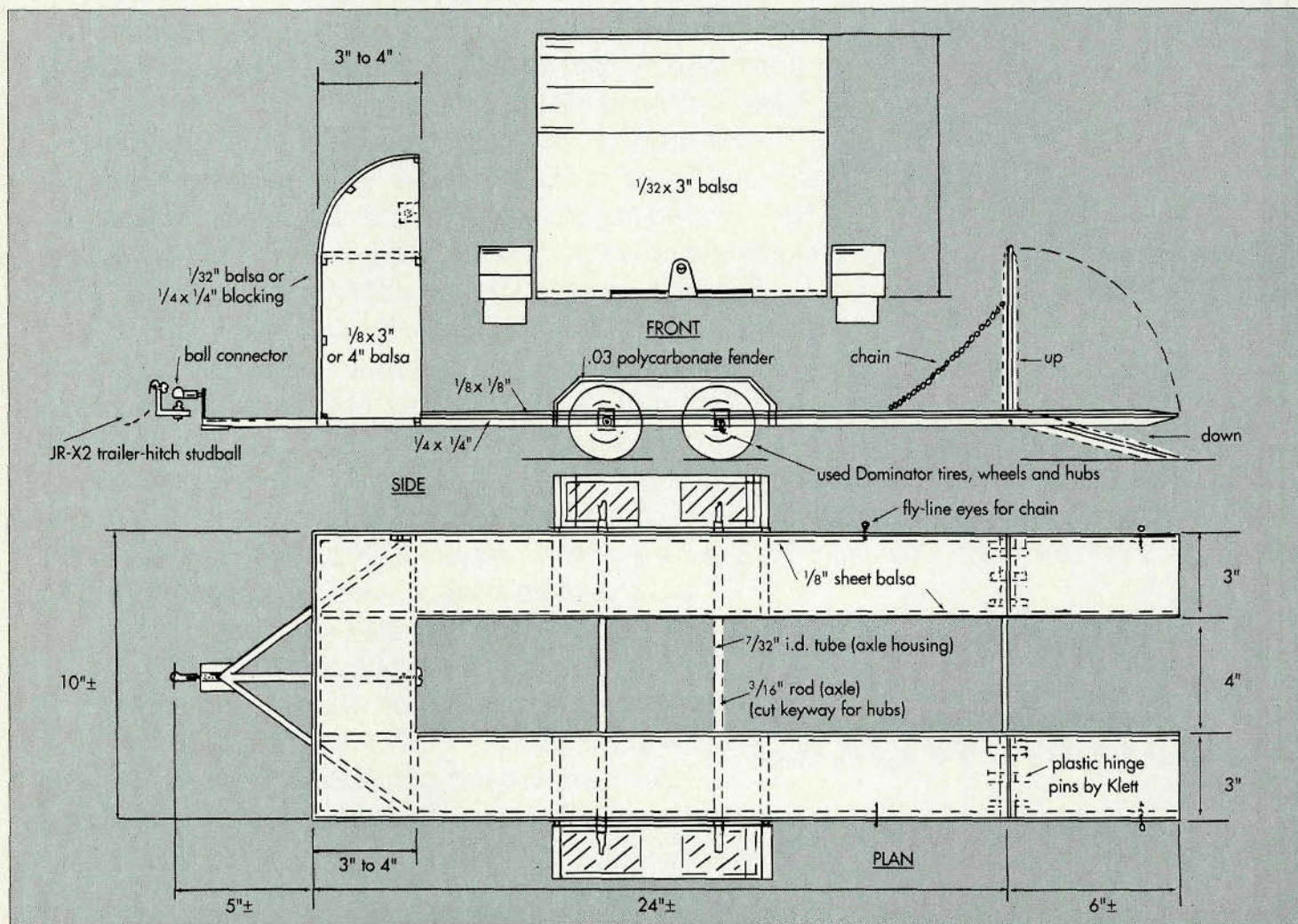
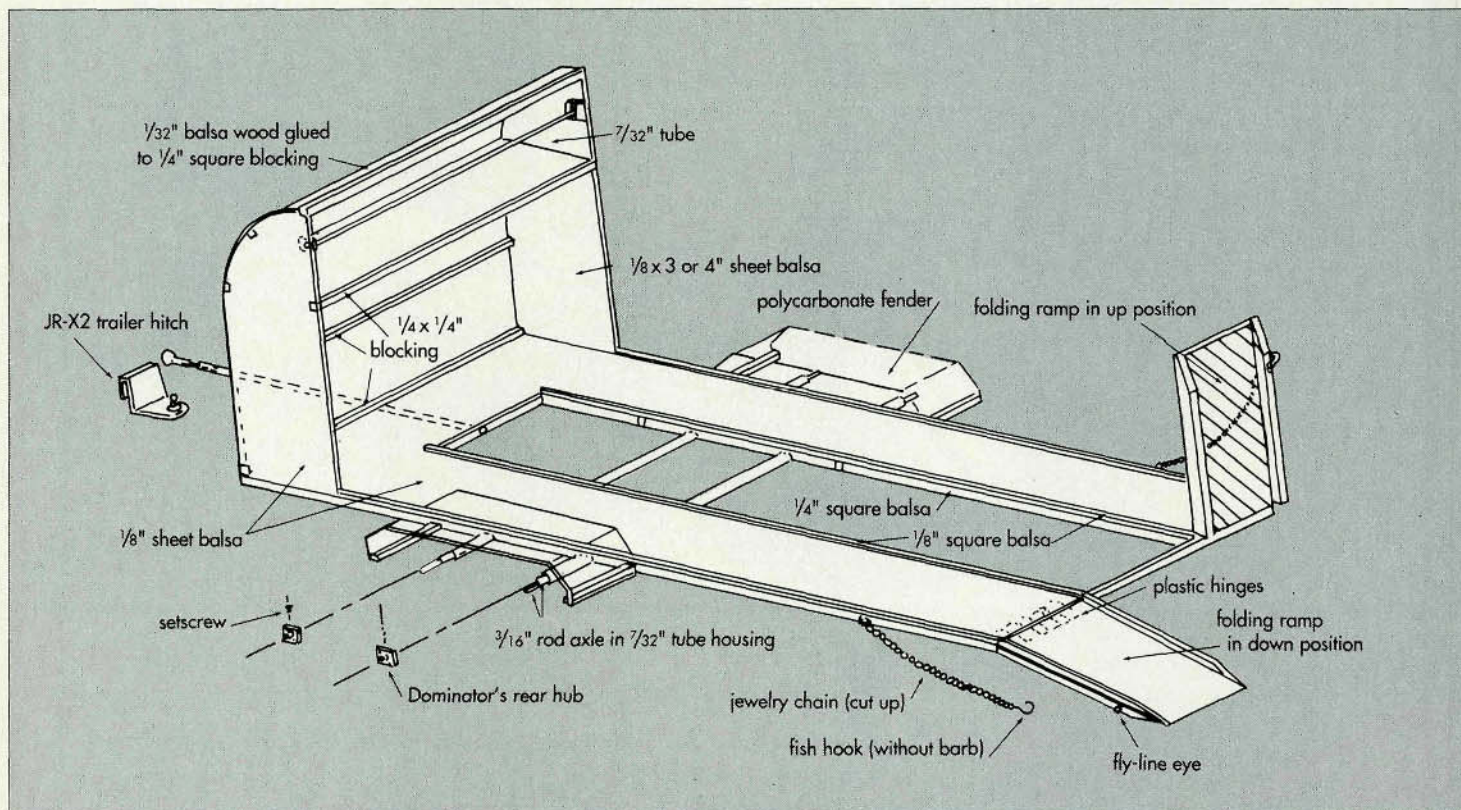
Tom is known for his impressive paint jobs, which are always concours contenders. The Rocket Wedge body with the Coca-Cola paint job is quite a sight. Complete with a rocket, smoke, flames and a detailed cockpit, it looks great when he tows the Dominator on his trailer with Team Losi's* JR-X2. Although it can't be judged with the car, it sure turns some heads when he drives it into the judging area.

The trailer's basic construction is similar to that of Jim's original version. When Tom had figured out

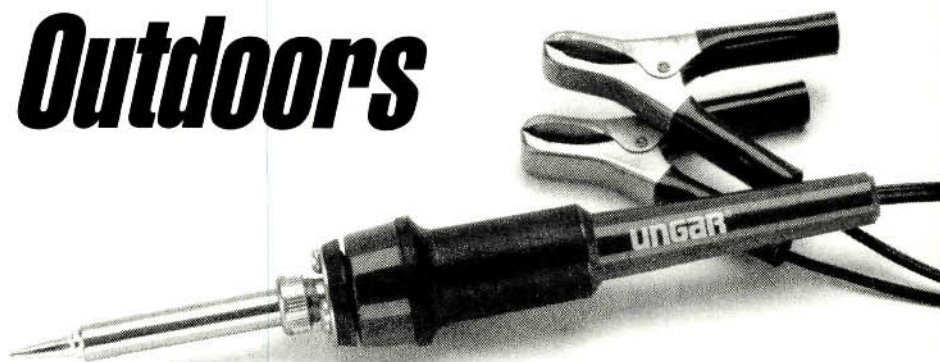
CARBONATED CUSTOM WORKS

by JOHN HUBER

COCA-COLA DOMINATOR



Sizzle Your Solder... Outdoors



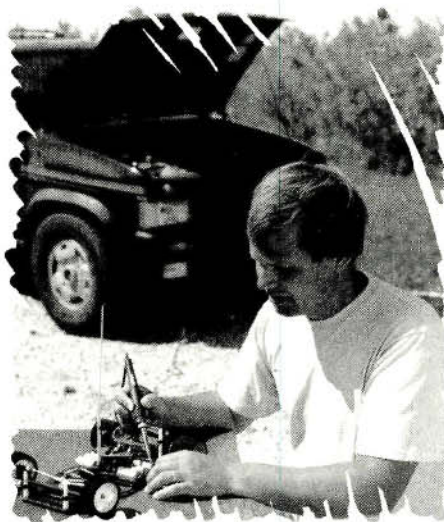
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the dimensions, he was ready to start building. Most of the trailer is made of balsa, but, to increase strength, you could use spruce for the 1/4-inch-square stock. Balsa is better for the sheet stock because it's easy to cut and shape, and it becomes stronger when it's painted.

To curve the 1/32-inch balsa for the air-dam's front surface, soak it in warm water for at least 15 minutes. (A little ammonia in water helps to break down the cellulose in the wood, and this makes it even more flexible.) To shape the wood, bend it around a can that's slightly smaller than the size you need, because the balsa will flex back a little. Tape it into place, and let it dry overnight. This curved piece is for the upper half of the air dam and the tire-storage area; the nose of the Dominator fits in the lower half. A length of 7/32-inch aluminum tube keys-in across the tires to secure them for highway travel.

Tom used .030 polycarbonate for the fenders, because it's much more durable than balsa and easy to bend. To form the fenders' angles, use a vise, or wedge it between a door and its frame. Once bent, it retains the angles well. Like polycarbonate bodies, the fenders can be painted from the inside. Tom put a set of old Dominator tires on the trailer so everything matches perfectly. To make the car safe for highway travel, two ramps fold up and are secured by chains. (I hope Tom asked his wife if he could use the chains that he found in her jewelry box!)

Tom's JR-X2 with an Andy's* Jeep body and a Diet Coke paint scheme tows his Dominator trailer to concours events in the Florida area. You just might spot it on the highway heading for the Northwest Florida Electric Automobile Racing's 1991 Dirt-Oval Championship in Panama City.

*Here are the addresses of the companies mentioned in this article:

Custom Works R/C Products, 3720 Easton Dr., Suite #7, Bakersfield, CA 93309.

Novak Electronics, 128-C E. Dyer Rd., Santa Ana, CA 92707.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

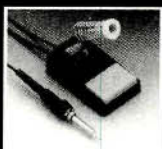
Team Losi, 1655 E. Mission Blvd., Pomona, CA 91766.

Andy's R/C Products, 466 W. Arrow Hwy., Unit K, San Dimas, CA 91773.

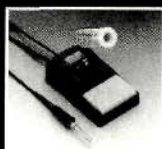
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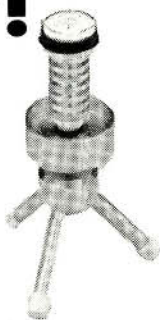
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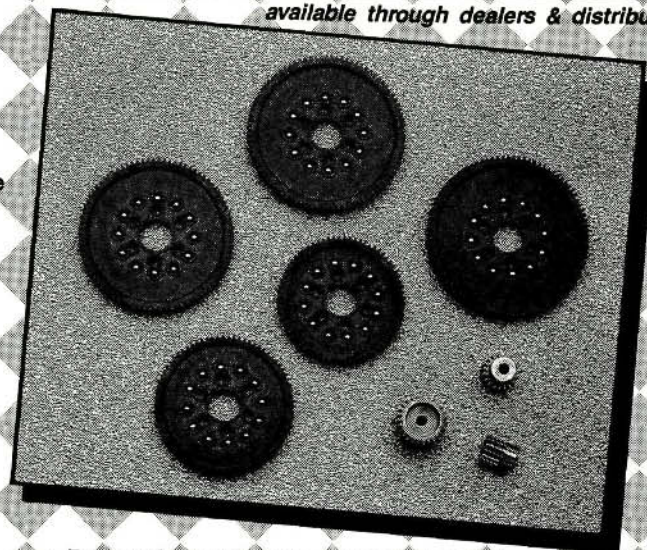
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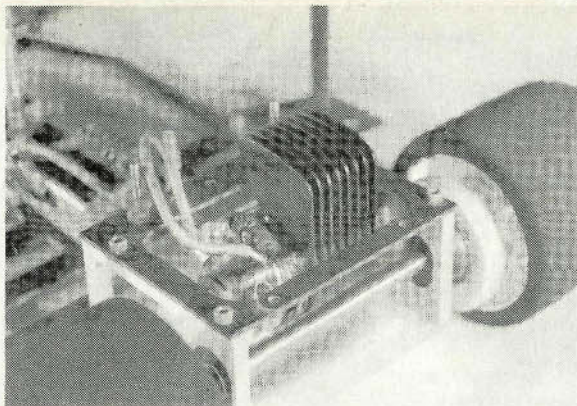
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PHOTOS BY JIM SHEPKA

Stomp -0- Pamla



body-mount brackets and the assorted hardware come in separate packages, each with its own instructions. Once I had completed the

body, it took me less than 20 minutes to convert this 4WD car into an awesome monster truck!

BODY MOUNTS

First, I removed the stock hardware from the shock tower, i.e., the locknut, the

LAZER CONVERSION

washer, the spacer, the 3mm nut and the bolt. Then, I aligned the kit's front body mount with the shock-tower holes and secured the mount to the tower with the stock hardware. Because of the body-mount's thickness, I had to eliminate one of the spacers between the shock and the shock tower so that the unit would go together properly. Using the supplied hardware, I fastened the body-mount posts to the bracket. Remember to attach the posts to the bracket before you mount the bracket to the tower; otherwise, you'll have a tough time positioning the screwdriver so that you can attach the posts firmly.

To mount the rear body-mount bracket, you'll have to remove the wing-mount assembly. With that out of the way, remove the top two rear shock-tower screws (they're attached to the rear bulkhead), and align the bracket with



The conversion is simple, as shown by the few parts needed for assembly. Here's everything that comes in the kit—minus the body.

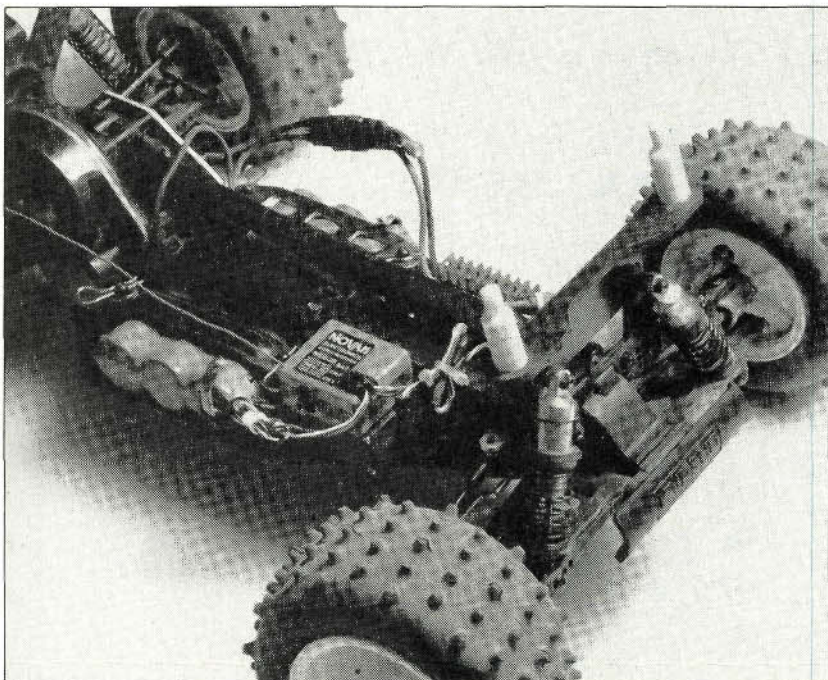
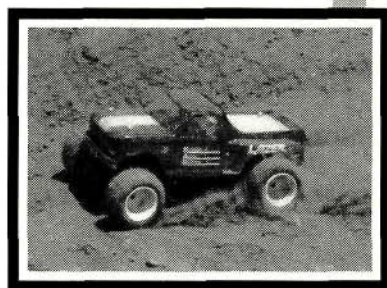
these holes. Using the longer screws supplied by JG, fasten the bracket to the bulkhead. Don't

forget to mount the body posts first!

The rims are of a molded one-piece design, and mounting the tires to them

is pretty straightforward. Once they're mounted, don't forget to apply a few drops of CA so that the tires won't slip on the rims.

When the glue has set, simply swap the monster tires for the stock units.



The front suspension isn't different from stock, but a body mount has been added to the front shock tower.

DETAILING

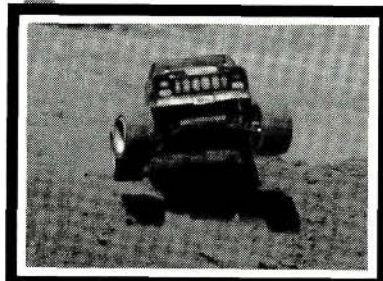
I turned the airbrush duties over to Mark Smith, who does a first-class job. First, he washed the body with warm, soapy water, and then he coated it with liquid mask. When he had cut out the design, he sprayed the body with various coats and colors of Pactra* paints. For the detail work, he used a

LAZER CONVERSION

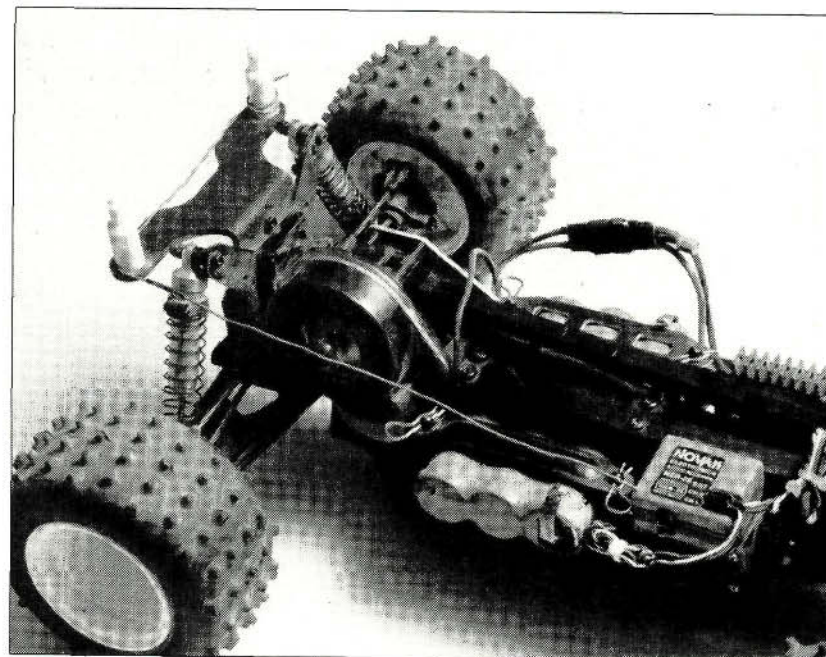
fine-point highlighter pen and Autographics* decals.

When I had mounted the body on top of the enclosed, foam, body-mounting pads, I was ready for one of *Car Action's* famous road tests. With Kyosho's horsepower, Victor's* fuel injection, Novak's* telemetry and Trinity's* "nuclear fission" (plus a little itty-bitty pinion gear from the bottom of my toolbox!), I put the bigger-bang-for-the-buck theory to the test.

I gathered up my camera, truck, batteries and cooler (this is tough work, you know!) and headed to my formerly hidden on-road test circuit. Now the future site of another housing complex (what a waste of good



tarmac!), the land's transitional stage was perfect for my assault.



The rear is almost as it came out of the box. Only the rear body mount and truck tires have been changed.

Tearing through the rubble and debris as if on a mission from the Ayatollah (well, sort of), I managed to produce more "oohs" and "ahs" with this test than from any

other in recent *Car Action* history. That's the beauty of these assignments—I actually get paid for constructive (destructive?) criticism.

The folks at JG Manufacturing take pride—and rightly so—in this latest effort. The conversion handled all that I could dish out without a hitch. Although I couldn't get to a track to compare this truck with its racing counterparts, you can take solace from the fact that JG's conversion kits placed in the A-Mains at the recent ROAR Off-Road Nationals.

By the way, did I tell you how hard this job is?

**Here are the addresses of the companies mentioned in this article:*

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

JG Manufacturing, P.O. Box 6014, Whittier, CA 90609.

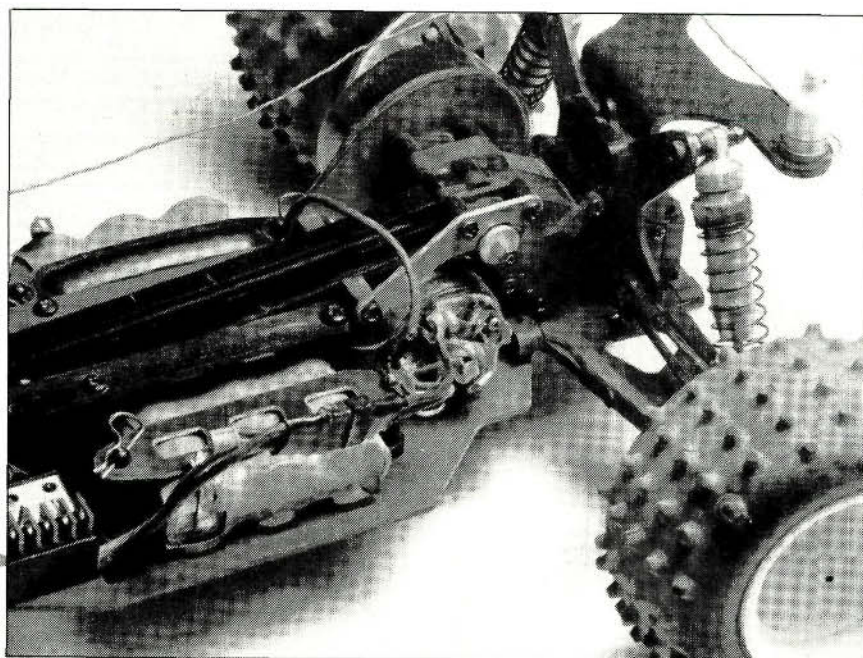
Pactra, 1000 Lake Rd., Medina, OH 44256.

Autographics of California, 7401 White Lane #1, Bakersfield, CA 93309.

Victor Model Products, 12258 1/2 Woodruff Ave., Downey, CA 90241.

Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92907.

Trinity, 1901 E. Linden Ave. #8, Linden, NJ 07036.



Again, no visible mods. The Lazer is strong enough to take the usual abuse to which monster trucks are subjected.

HOME-MADE

TIRE TRUER

ROUND 'EM UP!

by JIM SHEPKA

I'M SURPRISED AT how many racers don't properly maintain their cars' tires. Because they're the only part of the car that touches the road, tires are important in determining any vehicle's setup and handling. Since we don't have the luxury of pneumatic tires or exotic compounds, the average racer, using foam tires, is subject to certain limitations. It's important, however, that as much of the tire's surface as possible contacts the road.

Have you noticed how the factory-trued tires that you paid extra for at the hobby shop aren't up to specs after a few runs? If you can't afford a new set every time you run, here's a plan that will save you time, money and give you consistent runs and more track enjoyment. For the cost of a set of pre-trued rear tires (about \$28), and a little time and mechanical skill, you can build your own tire-truing machine! A racer in our club, Mark Smith, designed a simple, effective machine that does the job!

THE TIRE-TRUER TASK

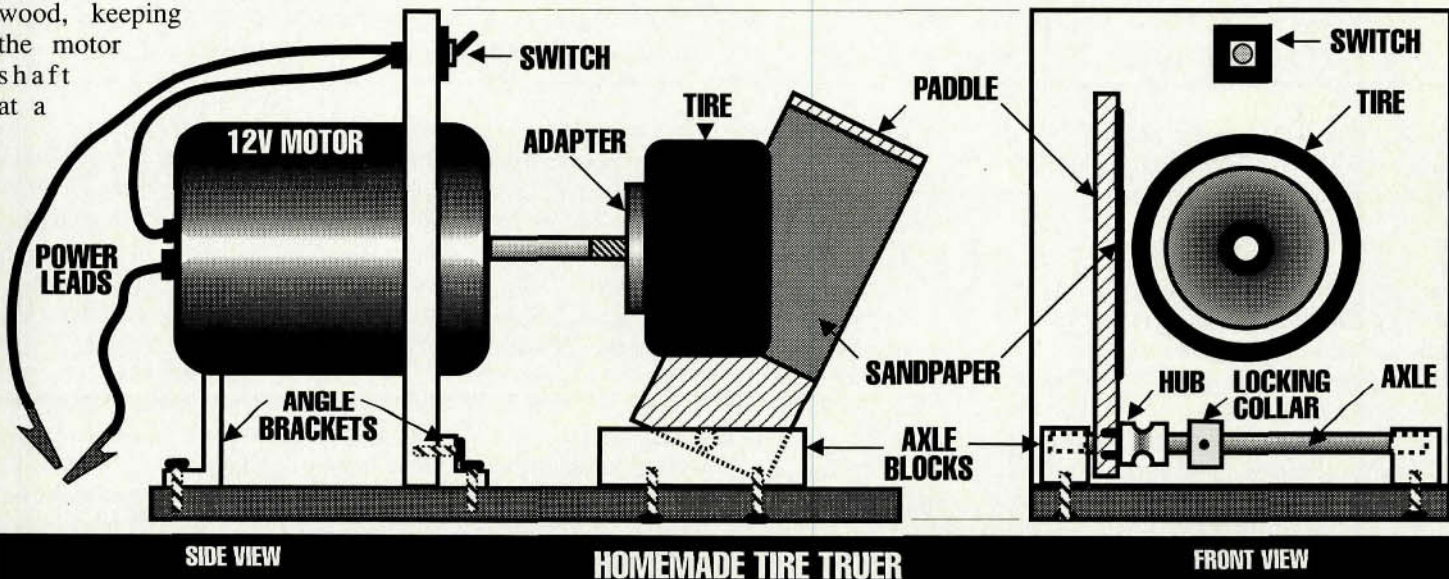
A 12V fan-blower motor from a junked GM car was this project's main ingredient. Mark attached angle irons to the motor and bolted it to a piece of scrap plywood, keeping

the motor shaft at a

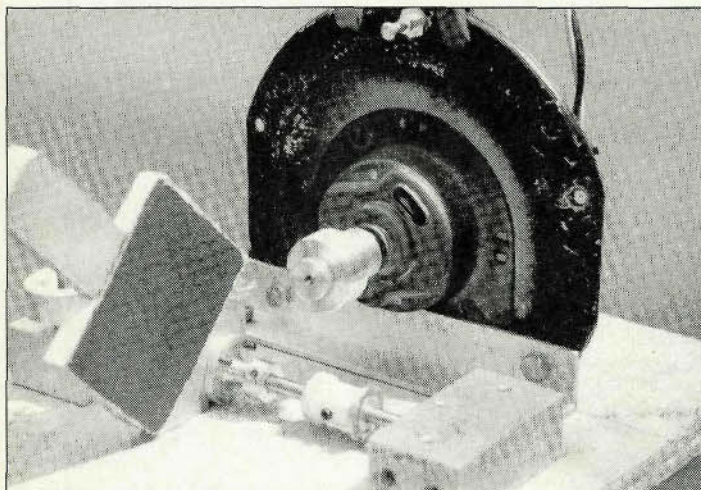
90-degree angle to the surface. Once the motor had been securely mounted, he made an aluminum adapter and tapped it in so that it could be bolted directly onto the $\frac{3}{16}$ -inch-thread motor shaft. Mark also made separate adapters so that front and rear tires could easily be mounted on them.

With the tires now spinning true off the blower motor, Mark needed a way to accurately shave the tires at just the right angle. He began by fashioning aluminum axle blocks and drilling holes in their centers to accommodate a pan-car rear axle. He slid a pan-car rear hub over the axle and attached a paddle, covered in 50-grit sandpaper, to the hub. (Attaching the paddle to the hub lets you rotate it left-to-right and fore-to-aft.) Mark attached a locking collar to the axle to serve as a depth (circumference) guide. With the axle/paddle assembled, he attached one block to the platform and inserted the axle into the hole. The process was repeated for the second block.

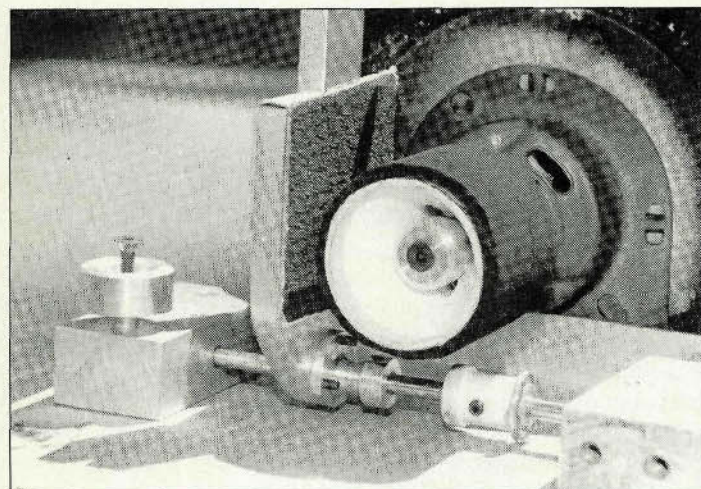
With the basic design finished, Mark only had to add an on/off switch and power leads with alligator clips to complete the electrics (remember, this is a 12V motor!). Although aluminum was used in this project, Mark says that you could use wood for



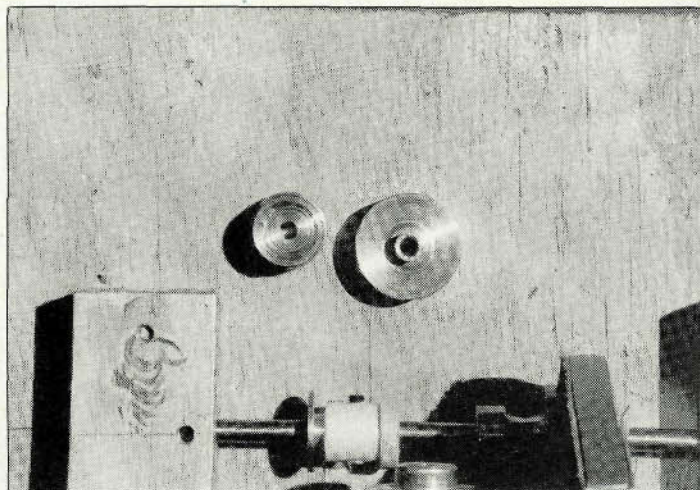
TIRE TRUER



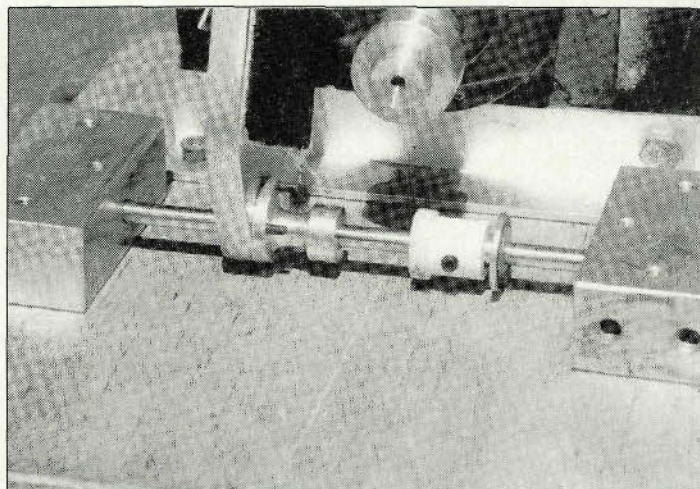
This simple, easy-to-use unit can be made fairly quickly and only costs a few bucks. The results are impressive.



Fifty-grit sandpaper is applied to the paddle, which is moved back and forth over the surface area to "freshen" and true the tire. Set the locking collar to establish the tire size.



Front and rear adapters were made out of aluminum for a variety of hub configurations. More simply, you could tap a rear pan-car hub and thread it onto the blower motor shaft.



This view shows how the paddle is mounted to the hub, which, in turn, rotates on a standard pan-car rear axle. The axle blocks are made of aluminum, but wood can be substituted. The white nylon hub serves as a locking collar to set the tire size.

PARTS

- 12V G.M. blower-fan motor ● Angle irons ● Scrap plywood ● Aluminum or wooden block ● Pan-car rear axle ● Pan-car rear hub
- 50-grit sandpaper ● Wheel collar—1/4-inch i.d. ● 12V SPST switch ● Power leads ● Alligator clips

the axle blocks and paddle assembly. You could also tap-in a rear hub to fit the motor shaft instead of making one.

TRUER-TIRE TIPS

Here are a few tips that will help you get back on the track. After every couple of runs, hit each tire for just a second or two to clean the surface area. Move the paddle back and forth, lightly touching the surface. This takes out any high spots that may have developed and exposes a fresh foam patch. You'll notice that the sheen will have gone and the tire should feel like new. Have a tape measure handy to meas-

ure its circumference. It's important to get the tires as equal in size as possible so that you can accurately check your chassis' tweak. If one tire is slightly larger or smaller than the others, it will drastically effect your car's handling.

Of course, if you want stagger, here's an opportunity to experiment. If you aren't sure what stagger is, simply take a paper cup that's wider at one end than at the other, put it on a smooth surface and roll it. Notice that it always turns to the side with the smaller diameter. The same principle applies to your car. If you put smaller tires on the car's left side than on

the right, the car will pull (turn) to the left. How much stagger to use is the million-dollar question. I suggest that you shave off a little (no more than 1/16 inch) at a time. If you run on the same track every week, you'll soon have a good idea of the tire size that works the best for your chassis setup.

This machine has been a life saver at the track, and it always draws a crowd. (For a nominal user fee, you can even put some money in your pocket.) With a little time and imagination, you can make this unit, and your efforts will be well rewarded at the track. ■



K Y O S H O

ULTIMA II



PHOTOS BY BOB GAGNE

b y B O B G A G N E

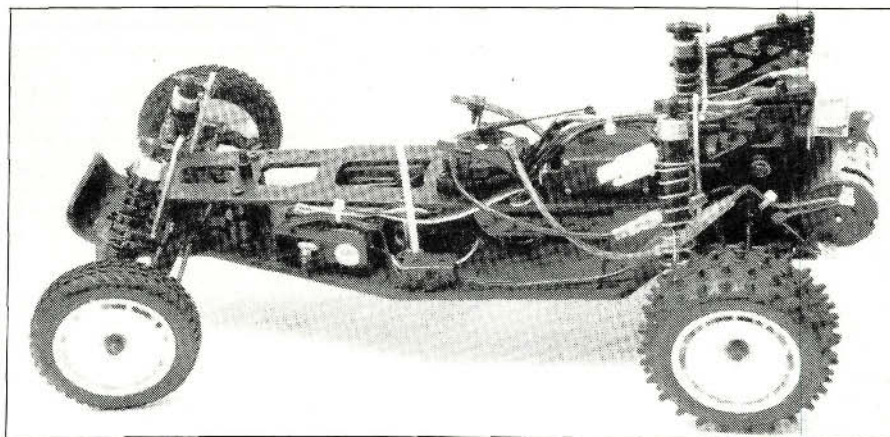
WHEN I REVIEWED my last Kyosho* product—the new Ultima Pro—it was the hottest thing out there. Then Kyosho offered the Ultima Pro XL as its newest all-out racing machine, but most racers don't have the bucks needed to set up one of these track burners. (The XL kit costs \$269.95, but it doesn't include a motor—\$28—or an electronic speed controller—\$115.)

Kyosho hasn't forgotten beginners, though. Its durable, budget-priced Raider is available in several configurations, and it has been competitive in production- and novice-class racing. Kyosho hasn't produced an affordable, competitive car to bridge the gap between its Pro and novice cars, however...until now!

BUDGET FLYER

Enter the Ultima II, Kyosho's latest model. Although it resembles the other Ultimas (it has the same polycarbonate body and aerodynamic wheels), it's very different. In some ways, it's a throwback to the original Ultima and Turbo Ultima, but it also has some high-tech components. It comes with a good speed controller and a motor—all for under \$200 (a price right between those of the Raider and the Ultima Pro XL).

ULTIMA II



The completed chassis with all the electrics installed.

THE KIT

The car comes in a compact, attractively illustrated box. The fancy bubble packs and graphics were eliminated to reduce costs, and the savings made were used to upgrade the quality of the parts.

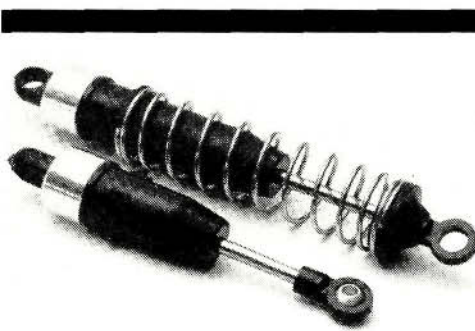
The Ultima II has the same dimensions (height, front and rear track width, overall length and wheelbase) as its all-out, top-competition, racing brother—the Ultima Pro XL. This should give it similar handling characteristics—a real advantage for a car in this price range.

The kit has an interesting blend of materials. It includes Kyosho's successful molded shocks, which are made of what seems to be a composite. The chassis, pan and radio tray are all made of a molded material called "Kelron," which is more flexible than fiberglass or graphite and can take much more punishment than the ABS plastic used on inexpensive tub-chassis cars. (Remember: this is an affordable car, and graphite chassis are expensive.) Kyosho also ignored the trend of using fiberglass shock towers by supplying aluminum units, front and rear.

The Ultima II includes some tried-and-true components that are found on older designs. The steel-gear differential, which uses 32-pitch gears,

was disappointing; 48-pitch gears (which are used on the Ultima Pro and the newer Tamiya products) give you finer gear ratios and smoother, quieter running. The two-piece front wheels (onto which the tires must be glued) are from the Turbo Ultima. The plastic bushing collars used in the transmission were disheartening; all the other bushings are of durable metal.

As usual, Kyosho's instructions are good (although I found a few minor mistakes); they even include an exploded parts view and a section on suspension adjustments. The basic manual is easy to understand and extremely helpful (especially for beginners). Each step includes line



These shocks work smoothly. The bodies are made of a composite that's much like the Kelron used for the chassis.

drawings with scale illustrations of the hardware, and the parts are identified by an alphanumeric system that tells you in which bag each can be found. What could be easier?!

ASSEMBLY

Assembly is divided into sections. The first few steps deal with the shock

Type 2WD off-road
Scale 1/10
Sug. Retail Price \$199.95

DIMENSIONS:

Overall Length 14.5 inches
Width 9.5 inches
Wheelbase 11.1 inches
Front Track 7.8 inches
Rear Track 8.2 inches

WEIGHT:

Gross (w/battery) 53 ounces

BODY:

Type Aerodynamic
off-road buggy
Material Polycarbonate

CHASSIS:

Type Flat pan
Material Kelron

DRIVE TRAIN:

Type Pinion/spur
Transmission Gear-driven
Differential Planetary gear
Bearings/Bushings Steel bushings

SUSPENSION:

Type (f/r) Wishbone/control arm
Damping (f/r) ... Composite, oil-filled,
coil-over shocks

WHEELS:

Front: Type Plastic two-piece
Dimensions (DxW) ... 2.1x.815
inches
Rear: Type Plastic one-piece
Dimensions (DxW) ... 2.1x1.36
inches

TIRES:

Front Low-profile "gator-back"
Rear Low-profile spike

ELECTRICS:

Motor Kyosho 05 LeMans stock
Battery 6-cell stick pack
and 6- or 7-cell
saddle pack
Speed Controller Kyosho
heavy-duty
mechanical rotary

OPTIONS AS TESTED:

Futaba Magnum Jr. radio system; 6-cell SCR battery pack.

COMMENTS:

The Ultima II is a potentially strong competitor. The Kelron chassis and composite shocks not only keep the price of the kit down, but they also function well. With a few modifications, this car can run with the finest!

ULTIMA II

absorbers, and this is where I found one of the errors in the manual. On page 7, the instructions indicate that there should be *four* 5.8mm lower-shock-mount balls. There are only two, and they should be used on the *front* shocks only. The rears fit onto 3x5.8mm pivot balls that screw into the lower control arms.

Assemble all the rods, the transmission and the front and rear suspension systems. Tips are included in the text that accompanies the line drawings. Although you could probably assemble the kit without reading a word, the instructions will keep you out of trouble in the tricky sections. One of the most important tips mentions the use of "screw cement," or thread-locking compound.

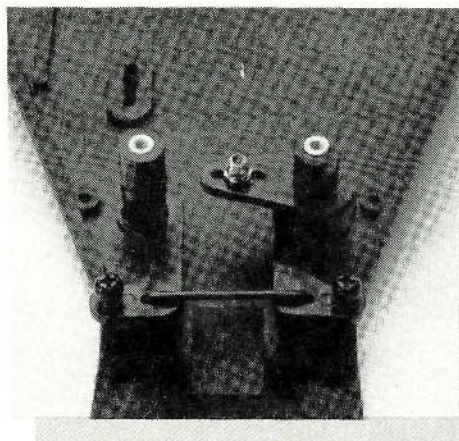
center rod that connects the two servo-saver arms is a bent-wire unit that should have ball ends, perhaps with a turnbuckle-type threaded rod. This would make toe-in/toe-out adjustments much easier (by turning the center rod) and eliminate the play that all bent-wire linkages soon develop.

Kyosho understands that bent-wire parts wear; there's a ball end on the servo-saver end of the steering link that goes between the servo-saver arms and the servo arm. But a *bent-wire* system connects the link to the servo arm! A second ball end and a

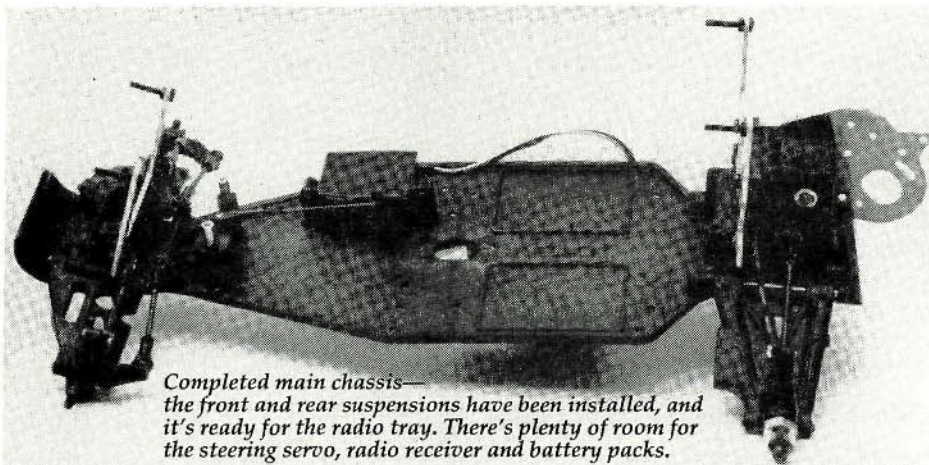
also prevent premature linkage wear. This is an economically priced kit, and I suppose that this omission keeps the production cost down.

The final major assembly step is installation of the radio gear and electrics. The heavy-duty rotary speed controller is a big improvement over other step-type designs. It effectively seals out dust and dirt and works very smoothly. The only potential problem—letting the motor leads touch when the battery is plugged in—is addressed in a warning in the instructions. Unfortunately, it's at the end, instead of in the "Checking the Radio" section, where this mistake is most likely to occur.

Kyosho offers two options for mounting the batteries. The first is to mount a stick pack crosswise on the radio tray with pull-tie-style straps. This is convenient, but by strapping the battery pack to the radio tray, you raise the car's center of gravity. The second option is a clamp-type mount for saddle-pack batteries that goes on the Kelron chassis. This is less convenient, but it lowers the CG considerably. Because most of my battery packs are of the stick variety, I opted



The servo-saver steering arms are mounted on aluminum pivots that also serve as mounts for the radio tray and as chassis stiffeners.



Completed main chassis—the front and rear suspensions have been installed, and it's ready for the radio tray. There's plenty of room for the steering servo, radio receiver and battery packs.

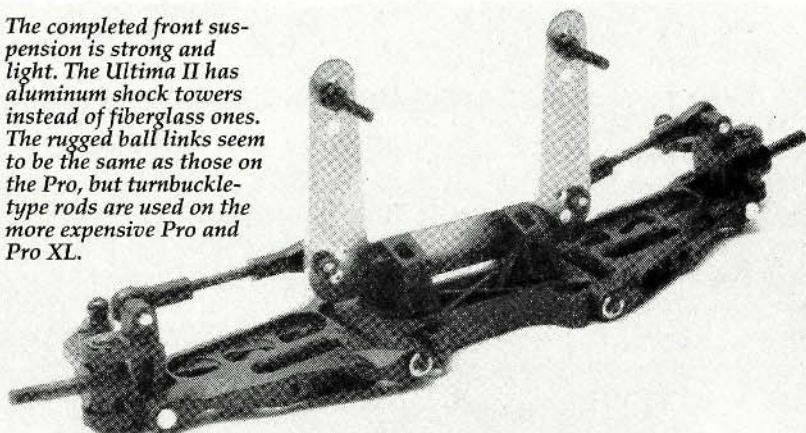
To prevent vibration from loosening the parts, this should always be used where there's a metal-to-metal fit, and Kyosho even supplies a tube. Way to go, Kyosho!

When you've completed the suspension and transmission assemblies, bolt them to the chassis, and then install the radio plate. The Kelron chassis is somewhat too flexible on its own. The Kelron radio plate significantly reduces this problem, and a graphite or thick-fiberglass radio plate will eliminate the flexing completely.

Most of the assemblies are first-rate, but some small additions would improve the car's performance. The

turnbuckle rod would not only make fine-tuning the wheel alignment and servo-centering easier, but it would

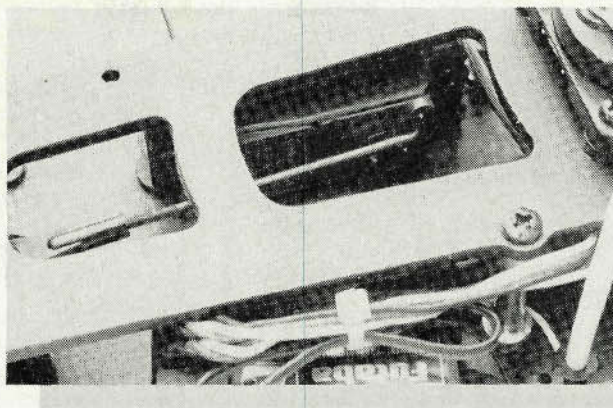
The completed front suspension is strong and light. The Ultima II has aluminum shock towers instead of fiberglass ones. The rugged ball links seem to be the same as those on the Pro, but turnbuckle-type rods are used on the more expensive Pro and Pro XL.



for the first mounting method. I expected the car to roll on sharp corners, so I was surprised that this wasn't a problem.

PERFORMANCE

After painting the body with Pactra's* fluorescent yellow (the photos don't do this color justice!), I headed to the track for a photo session and testing. Considering that Kyosho supplies a conservative 15-tooth pinion and a very good (but hardly a killer) 05 closed-endbell LeMans motor, the car moved along nicely. With the help of



A ball link is used on the servo-saver arm side (partially hidden by the radio tray), but the bent-wire system is used on the servo arm. This wears quickly and causes steering slop. Two ball links would be smoother and more durable.

top club racer and long-time Ultima fan Steve Bettencourt, I set up the suspension to handle my local test

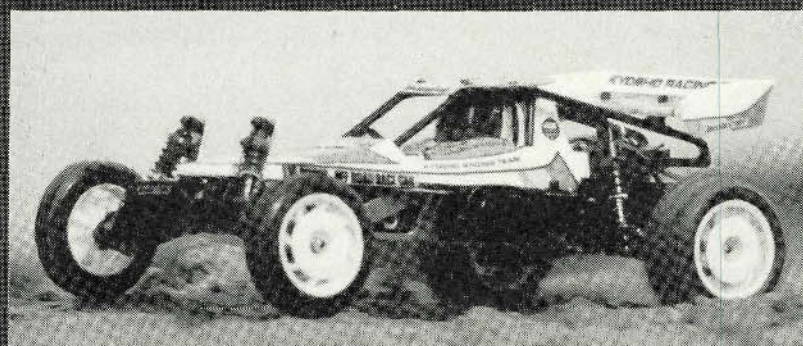
track. This short oval is full of moguls, dipsy-dos, bumps and rocks. It has one killer jump, and to make things worse, its hard-packed dirt and light covering of dust make turns very slippery!

Although the car handled well, it had a tendency to nose-dive off the jump. You can correct this by using a heavier shock oil in the rear. The car also oversteered coming out of the turns—a problem that's common in cars with planetary gear diffs. Fortunately, the Ultima II has the same transmission case as the other Ultimas, so the problem can be corrected by installing the ball diff from an Ultima Pro or Pro XL. Otherwise, the Ultima II was stable over moguls and bumps, and it didn't wander down the high-speed straights.

The following weekend's club races were the real test, and the Ultima was up to the challenge! In both of my qualifying heats, I stayed right with the competition and made the A-Main. It was difficult to keep up with the guys running the hot motors (like the B&R Motor Works Bullet or the Twister Pocket Rocket), but the Ultima II showed its racing heritage with a respectable finish.

Am I impressed?—yes! Kyosho has produced a car with real potential at an affordable price. With a few modifications, this car can race with the best of them!

**Here are the addresses of the companies mentioned in this article:
Kyosho/Great Planes Model Distributors,
P.O. Box 4021, Champaign, IL 61820.
Pactra/PlastiKote Co., 1000 Lake Rd., Medina, OH 44256.*



THE ORIGINAL ULTIMA

Kyosho made a bold statement back in 1987. Its new car—the Ultima—was touted as the next world champion even though there was nothing ground-breaking in its design. It had a channeled aluminum chassis, small red shocks and a gear differential. The results of the 1988 World Championships were stunning: not only did the Ultima win, but Ultimas also occupied the top three spots!

Kyosho modified the original Ultima and released a Turbo version, which featured some of the parts used on the world championship car. With larger Platinum shocks, a ball differential, a new body, a functional wing (to replace the roll cage) and a full set of ball bearings, the Turbo Ultima was ready to hold the crown that its predecessor had won.

Then two new cars hit the scene and challenged the Ultima's reign: the Losi

JR-X2 and the RC10 Graphite. Both were right on the weight limit; in fact, the Ultima was a few ounces too heavy, so it had to lose some weight. Along came the Ultima Pro, which had a graphite chassis (which increased the car's wheelbase) and Gold shocks that replaced the unreliable platinum ones.

When the competition grew even tougher, Kyosho introduced the Ultima Pro XL. With a revised gearbox and redesigned front and rear A-arms, the Pro XL was one mean machine!

As all these hop-ups were added, the Ultima's price rose, and Kyosho set out to make the car affordable again. The Ultima II is the newest version of the legend. I wonder what we'll see a year from now—the Turbo Ultima II Pro XL Custom Special Mid-Motor Design Car?

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ZOOMING ALONG AT 175mph in sixth gear, you feel the wind buffet your face; you hear the V-12 whining at the 14,000rpm red line and the tranny straining to hold itself together; and then, you shift into *seventh* gear! As the semiautomatic gearbox drops the clutch, the tires break loose, and the competition is left in your dust.

T A M I Y A

Ferrari F-1 Fever!

by ALEX STROUTHOPOULOS

F 1 8 9

Most of us will never have this experience; we just run and tune our R/C cars for maximum performance—just like the real thing! Formula 1 addicts have had an especially hard time because there haven't been any accurate F1 car replicas. This, however, has changed. Several manufacturers have released F1 cars that are realistic down to the helmet and suspension details!

Tamiya* has introduced its Ferrari F189 replica, which is based

on its venerable Road Wizard chassis. To make the car's handling live up to its image, Tamiya has improved the Road Wizard's chassis. The old, non-adjustable gear diff has been replaced by a new, ball-type unit. The six-ball diff's operation is smoother than that of the older version, and it should do wonders for the car's handling.

The rear suspension is a T-bar with a yellow, oil-filled, coil-over shock to control the damping. In the front, a floating-kingpin system is used to reduce the impact of small road irregularities. The suspension is anchored to the black, fiberglass chassis, and above the battery, there's a small plate on which the shock absorber is mounted.

A mid-mounted RS-540S controls the power, which is put to the pavement by means of a set of 32-pitch gears connected to a ball diff and steel axle. Behind the axle are the wing mounts, where the bi-level wing is attached to the chassis. The chassis' front end is protected by a wing that's made of a fairly flexible material that absorbs the bumps without shattering.

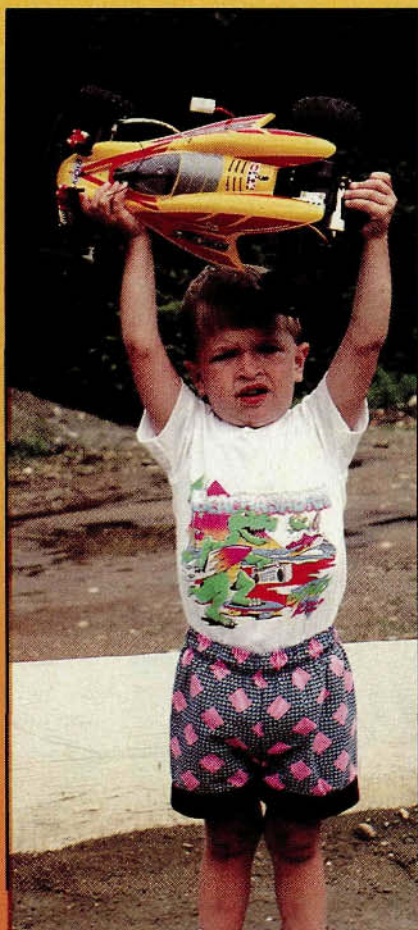
The car's scale-like appearance should make it a blast to drive around! I can just see two Ferraris and some red-and-white Marlboro McLaren's zooming around a tight roadcourse. I'm already getting my driving gloves on! How about you?

*Here's the address of the company featured in this preview: Tamiya/MRC, 200 Carter Dr., Edison, NJ 08817. ■



T A M I Y A

R/C racing car design has come a long way in the last few years, and its goal has been better performance. Unfortunately, as performance has increased, so has the price of R/C cars. Big-dollar designs and high technology have left entry-level racers at the starting line. Tamiya*—the originator of the affordable R/C car—has taken entry-level racers' cries seriously and introduced the Saint



Future world champion Ryan Murphy

Dragon. This 2WD, off-road racer is designed for first-time R/C fans. It's an ideal, easy-to-assemble car that also has the potential to give you a somewhat competitive performance (without expensive, after-market parts!).

THE KIT—IT'LL SLAY YA!

The Saint Dragon has a special, reinforced-resin front bumper and front coil-spring damper units that can easily be replaced with optional, oil-filled units for improved performance. The front stud-spike tires are mounted on one-piece, molded, dish wheels that have three rows of spikes. The entire front assembly is attached to a sturdy bathtub-type chassis, which provides first-time racers with the best protection for electrical components. The rear suspension is a double-wishbone system with similar coil-

spring damper units. Mounted in the middle of it, is a sealed gear-box system. The rear end is equipped with a pair of four-row spike tires on one-piece ABS wheels. Tamiya has taken the tra-

Saint Dragon

by FRED MURPHY



ditional, bevel-gear differential, incorporated a ball differential *and* kept the car affordable. They've combined "affordability," performance and reliability in one package!

Speaking of reliability, the Saint Dragon's 540 Mabuchi motor is great for beginners, and it's only a basic, standard 05 R/C motor! The sky is the limit, and the Saint Dragon's tranny could handle the

power of any *reasonable* motor. If you decide to use a modified motor, however, the instructions tell you to replace the stock plastic motor mount with an aluminum

(Continued on page 111)

TAMIYA SAINT DRAGON

Type 2WD off-road
Scale 1/10
Sug. Retail Price \$170

DIMENSIONS:

Overall Length 16 inches
Width 9.5 inches
Wheelbase 10.75 inches
Front Track 8 inches
Rear Track 8.5 inches

WEIGHT:

Gross (w/battery) 52 ounces

BODY:

Type Off-road buggy
Material Polycarbonate

CHASSIS:

Type Pan
Material Plastic

DRIVE TRAIN:

Primary Pinion/spur
Transmission Gear drive
Differential Ball
Bushings Nylon bushings

SUSPENSION:

Type Double wishbone
Damping Friction/ccil-spring shocks

WHEELS:

Front: Type One-piece plastic
Dimensions (DxW) 2x.75 inches
Rear: Type One-piece plastic
Dimensions (DxW) 2.2x1.2 inches

TIRES:

Front 3-row spike
Rear 4-row spike

ELECTRICS:

Motor Mabuchi 540
Battery 6-cell flat pack*
Speed Controller 3-step mechanical

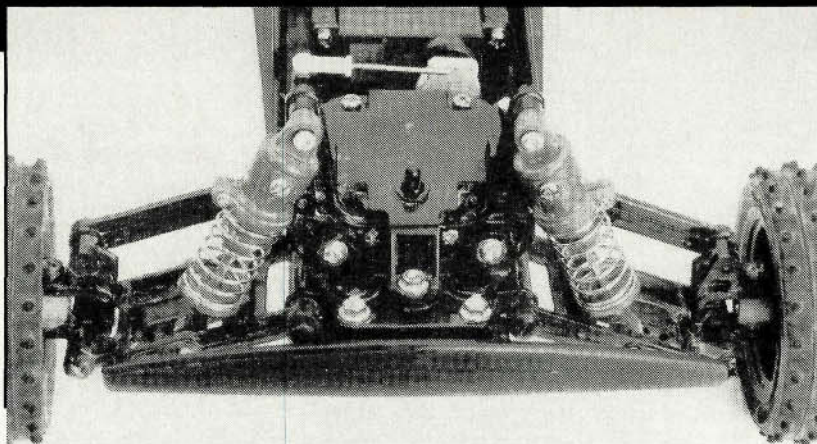
OPTIONS AS TESTED:

KO EXII 2-Channel Radio.

COMMENTS:

This is a well designed, flexible, entry-level car from Tamiya. With the addition of oil-filled shocks and ball bearings, the Saint Dragon may surprise many owners of big-buck cars.

* not included



The front suspension is a basic single A-arm with a fixed upper link. The standard friction shocks are found on other Tamiya models.

one from the Astute or the King Cab.

You supply the radio system, but Tamiya supplies the necessary speed controller and wiring to put you on the track quickly. The speed controller is a heavy-duty, three-step, forward-and-reverse unit with an external resistor.

The entire car is topped off by a sleek, polycarbonate body that awaits your wild paint scheme. If you accent the paint with the included decals, the only thing that will stop you is the finish line!

ANGELIC ASSEMBLY

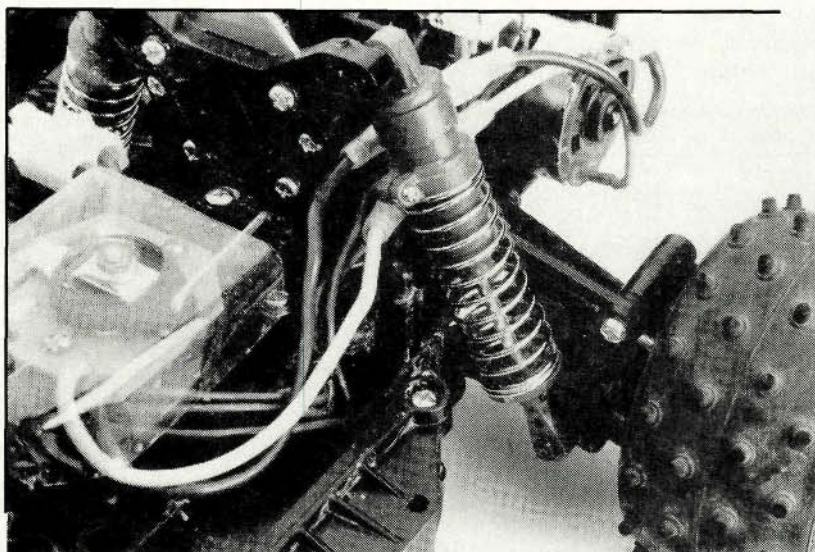
The Saint Dragon's assembly is a real joy—made especially easy for first-time builders. The assembly manual is well labeled, and there are full-size drawings of every screw and part. The parts bags are so well

labeled that it's almost impossible to mix up any parts. Tamiya has taken the time to make the project a pleasure—not a frustrating, guess-work job. I estimate that even a novice will take no more than five or six hours to assemble the Saint Dragon (excluding any body work or paint work).

SAINT OR SINNER?

With the car built and a 7.2V Ni-Cd pack fully charged, I went to the local track. I set up the Saint Dragon with the supplied, 23-tooth pinion gear bolted to the stock 540 motor. The 70-tooth spur gear allows you to use gears ranging from 23- to 16-tooth pinions, depending on your motor choices and driving style.

The warm-up passes on the test track weren't exciting, but they did



The rear shocks are the same, oil-less friction shocks used on the Madcap. (Again, note the fixed upper link.)

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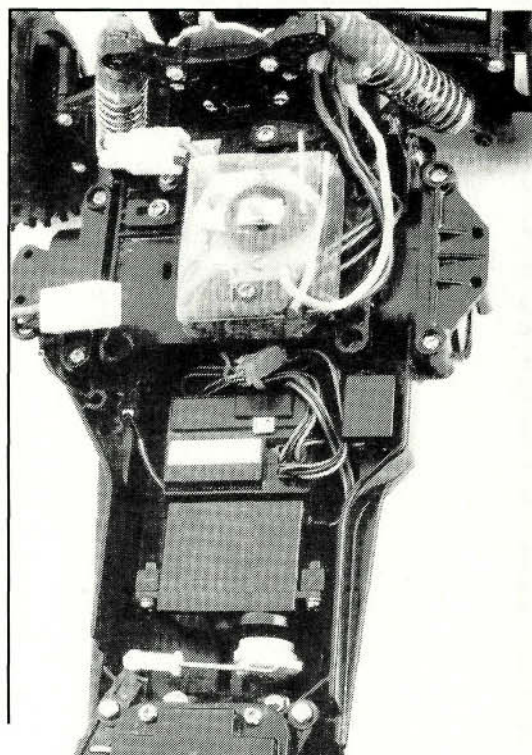
SAINT DRAGON

give me a feel for the car's turning ability, which was surprising for an entry-level car. As the Saint Dragon accelerated, it came alive like no other Tamiya car I've ever driven! Compared with other cars in its class, its suspension works very well, but there's still plenty of room for improvement. Over the jumps, the car nose-dived slightly, but that can be corrected by adjusting the springs. Off jumps, the Saint Dragon's suspension planted the chassis into the ground because of the absence of dampening in the shocks. Through the turns, the car had too much oversteer, but it wasn't unpleasant. As a matter of fact, it was fun!

On the second battery pack, I changed the suspension to see if the oversteering could be reduced. I decreased the rear-spring tension by moving the collar down about 5mm. The minor decrease in rear-spring tension helped harness the oversteer, but again, the lack of dampening was the biggest drawback.

For an entry-level, unmodified vehicle, the Saint Dragon was impressive! The stock setup's speed won't set the world on fire, but it's more than enough for first-time drivers.

The key to the Saint Dragon's design is that it's easy and inexpensive to improve performance. This

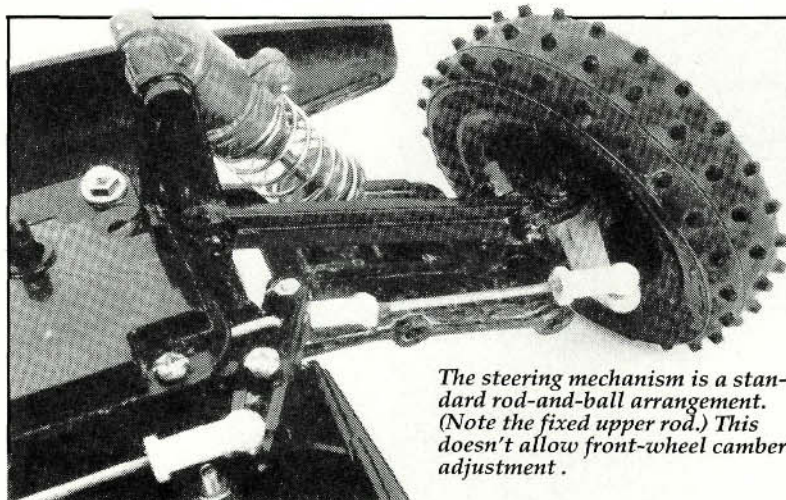


All the radio gear fits nicely into the Saint Dragon's tub chassis. Even oversized gear can easily be accommodated.

car is very flexible, and you can add simple options like oil-filled shocks and ball bearings to have an entirely new driving experience. Then you can try a variety of gears and motors for all-out performance. This car's possibilities are endless, and its name says it all: it's a *Saint* for the entry-level racer, and a *Dragon* that everyone wishes he could slay!

**Here's the address of the company mentioned in this article:*

MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.



The steering mechanism is a standard rod-and-ball arrangement. (Note the fixed upper rod.) This doesn't allow front-wheel camber adjustment.



K y o
s h o

RAIDER

by STEVE POND

A LOW-COST 1/10-SCALE OFF-ROADER
WITH THE BASIC INGREDIENTS
TO BE A
COMPETITIVE
MACHINE.



PHOTOS BY STEVE POND

SINCE THE INCEPTION of *Radio Control Car Action*, I've seen many R/C cars whose manufacturers claimed to have made times, I've even

supported some of these claims, because some cars *were* the best available at that time.

The introduction of the Kyosho* Raider has changed the way in which I assess an entry-level car.

The Raider is neither made of some new, space-age material that

reduces

the car's weight by half, nor

does it have a

revolutionary design that will make all other cars obsolete. In fact, there's little about the Raider to make it much faster than other comparable entry-level cars. "So, what," you say, "makes the Raider unique?" Read on!

THE KIT: The Raider features a bathtub-type chassis, independent semi-trailing-arm front suspension with upper control arms, independent A-arm rear suspension with upper control arms, a sealed gear-case with a



In stock form, the new Kyosho Raider is worthy competition for any car in its price range, but the versatile design shows more potential for modified racing than any other comparable kit.

Below: The assembled view of the Raider rear end reveals the high-performance LeMans 05 stock motor. A look to the top of the shock mounts reveals mounting locations for oil-filled shocks.

Bottom: The gearbox on the Raider features strong, glass-filled nylon gears.

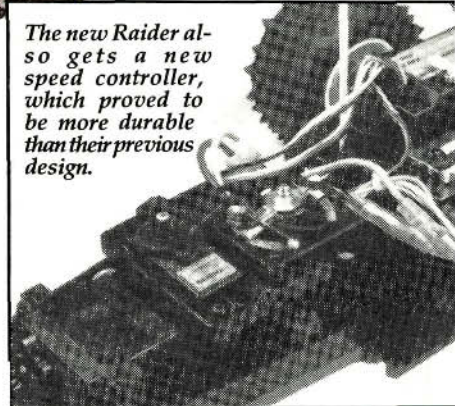
planetary gear differential, mid-mounted LeMans Stock 05 motor, a new, three-step forward-and-reverse speed control, friction-dampened shocks, bronze bushings supporting precision-molded nylon gears and, finally, a Lexan body.

You may recognize the Raider's suspension geometry as being similar to that of the RC 10. This independent suspension is one of the features that distinguishes the Raider from some of the pack, but it isn't what makes it an exceptional car.

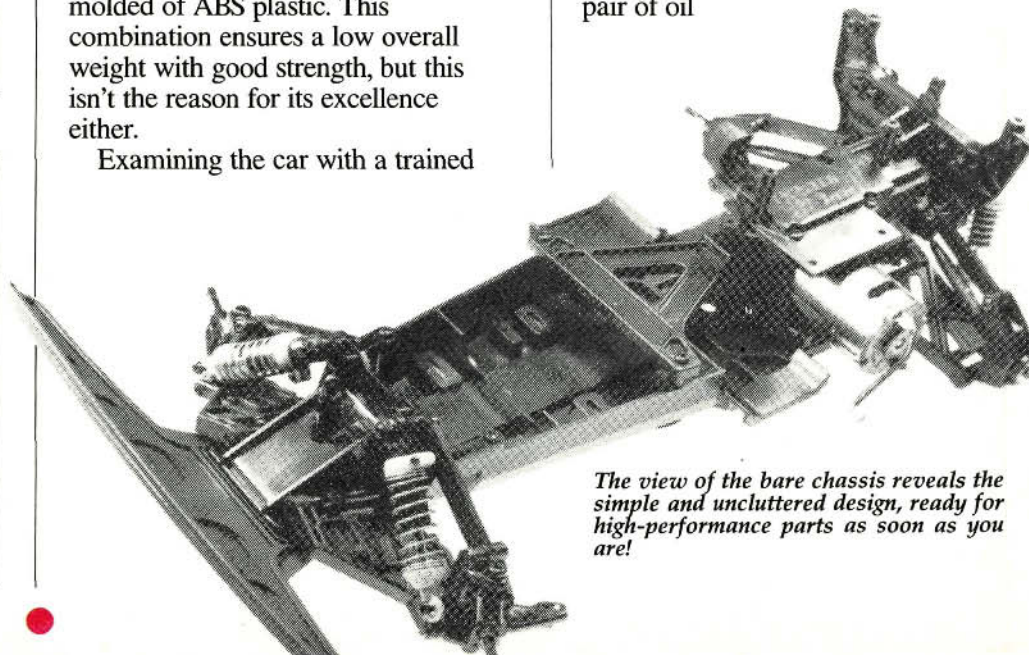
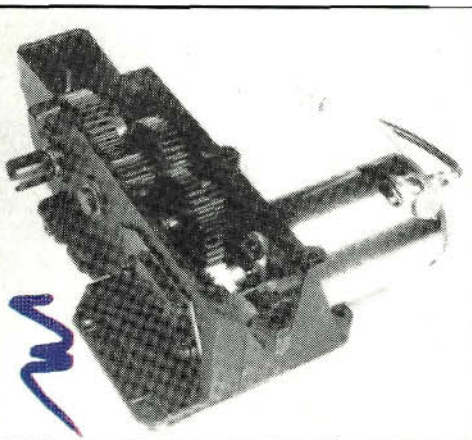
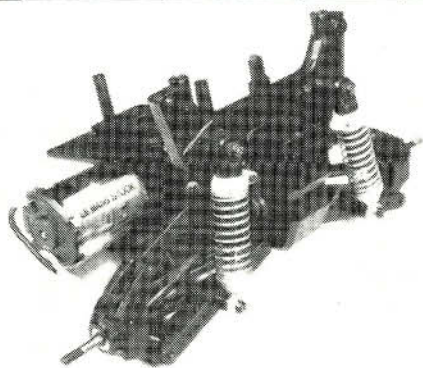
The differential housing and suspension arms are molded of glass-filled nylon, while the chassis is molded of ABS plastic. This combination ensures a low overall weight with good strength, but this isn't the reason for its excellence either.

Examining the car with a trained

The new Raider also gets a new speed controller, which proved to be more durable than their previous design.



eye, you'll notice that the rear suspension arms and the rear body mount will allow you to bolt on a pair of the Kyosho Option House oil-filled shocks. The front suspension also has mounts in the center of the A-arm (similar to the RC 10 mounting location) for a pair of oil



The view of the bare chassis reveals the simple and uncluttered design, ready for high-performance parts as soon as you are!

shocks that can be mounted in the upright position. Mounting locations for a horizontally mounted mono-shock are also molded into the front A-arm. The front and rear upper control arms on the Raider can also be exchanged for a set of adjustable control arms. The wheel-mounting system used on the Raider is also used on the more expensive cars in the Kyosho line, which allows you to change to a set of larger wheels and gives you more options for tread patterns. Starting to get the picture yet?

CONSTRUCTION

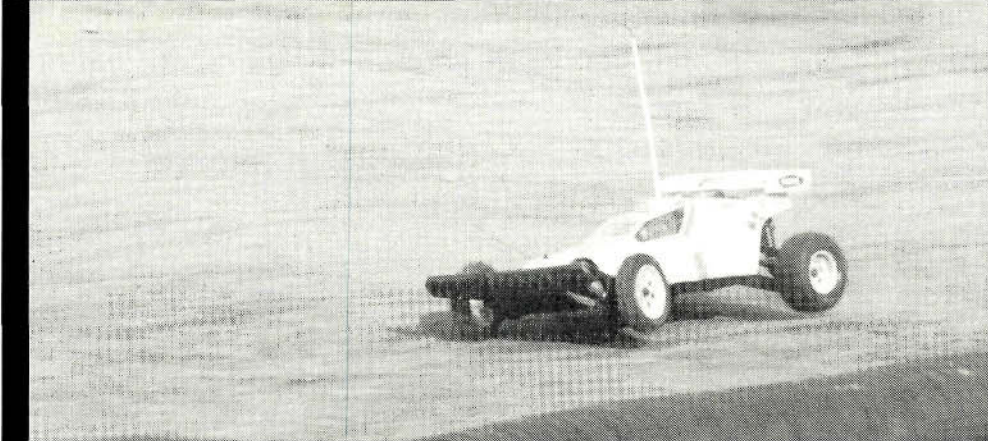
Prior to assembly, you'll have to buy accessories that make the Raider fully operational. The kit requires a 2-channel radio system, a 7.2V, 6-cell flat pack and a battery charger. The radio system used in this test is the Kyosho Pulsar 2000. This is a fully proportional pistol-grip radio with a compact receiver and two, precision servos. Since this is a Kyosho product, it fits easily. The battery pack is the Kyosho 7.2V, 1200mAh, charged with—you guessed it!—a Kyosho Lambda Quick-Charger.

Before starting the assembly, charge the battery and connect it to the radio system with the servo plugged in and the transmitter turned on. Before attaching the servo saver or speed controller, set the trim knobs to center, then turn off the receiver power switch and the servos will be centered. Put all this aside until later.

The assembly begins with the shock absorbers and the front end. The pictorial instructions are of the high quality found in most Kyosho manuals, but there aren't enough written instructions. This is common in Kyosho car manuals, but the excellent diagrams more than compensate. If the pictures are followed correctly, assembly shouldn't be a problem.

First, the front-end assembly is attached to the chassis; then the rear-end assembly and suspension are assembled and attached to the chassis as well. When attaching the motor to the differential housing, follow the diagram on the pinion-gear inspection cover that shows through which holes the screws should go, depending on what pinion you use. This allows you to change gears and adapt to a variety of tracks.

One notable problem encountered while assembling the rear suspension was the fit of the dogbones (or "swing shafts," as they're called in the instruc-



SECOND LOOK SERIES RAIDER UPDATE

HAVING RAISED the standard of entry-level cars from a dismal level, Kyosho's Raider is probably the most influential entry-level car on the market. With its rugged chassis, mid-mounted motor, and independent suspension with upper control rods all around, the Raider does something that standard entry-level cars don't: it handles well.

Although the car isn't ready to enter the Worlds, it holds its own at most race tracks, and it's versatile enough to take modifications (as Dick Brinton showed in our "Budget Racer" series, when he converted it into a respectable oval racer).

At its introduction, the Raider promptly established itself as the one to beat, and this didn't go unnoticed! At *Car Action*, we selected the Raider as our entry-level Car of the Year twice! The Raider is extremely popular, and there have been two offshoots of its basic design: the Raider ARR (an assembled version) and the Turbo Raider (a hopped-up version or factory hot-rod).

The Raider is a great entry-level car, and since there are gobs of them out there, you'll find them wherever off-road drivers gather.

tion manual) in the drive joints. The pins in the swing shafts weren't all round, and the slots for these pins had been machined off-center. This caused the swing-shaft to bind severely. After a good deal of shaft filing, the binding was eliminated. It was a design flaw on this particular kit and might not be a problem in every one, but keep your eyes open for trouble. After the rear as-

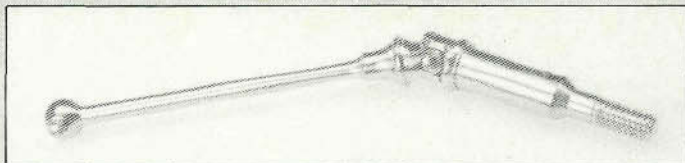
sembly is attached to the chassis, the radio is installed and, as mentioned, the Kyosho radio system fits perfectly!

I was pleased with the Raider's new speed controller. It's similar to the Tamiya*-type speed controller, which has been used successfully with a stock motor.

When the radio system's installation is complete, you only have to put on the



This shows that the chassis has ample room for the radio gear. Even the largest systems should fit without any problems.

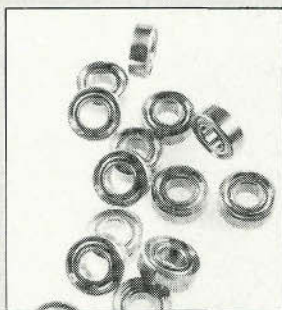


HOBICO **Universal Swing Shafts**

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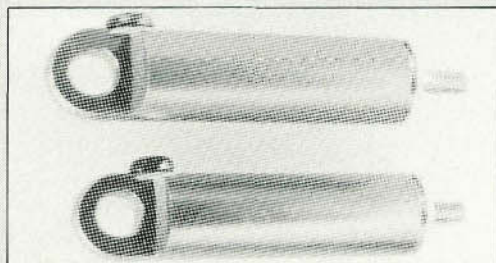


DURATRAX **Ball Bearings**

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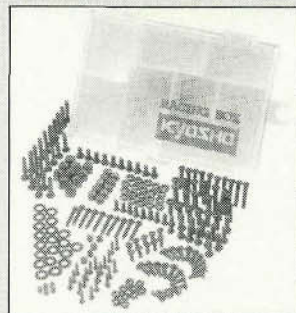
Price: \$44.95



KYOSHO **Baby Gold Shocks**

These smaller versions of the world-famous Kyosho Gold Shocks are direct replacements for the Raider's original friction shocks. With the oil-filled coil-overs, the suspension damping and handling are greatly improved. These shocks use the original hardware (springs, shocks ends and spring collars) and are direct, bolt-on options.

Part nos.: KYOC5689 (rear); KYOC5688 (front).

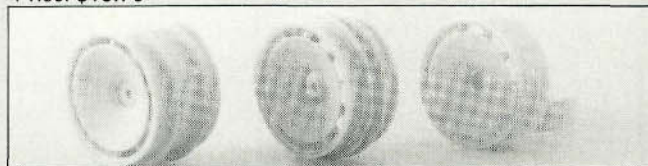


KYOSHO **Metric-Screw Set**

Ever been in the heat of competition, lost that "all-important" screw, and found that no one had a replacement? With the Metric Screw set, this doesn't have to happen. All sizes of metric screws, nuts and washers are included. The kit comes with a handy organized box, so you can find what you want quickly and easily.

Part no.: KYOC5567

Price: \$15.70



KYOSHO **Neon Wheels**

These are Kyosho's new, neon Raider wheels. They're directly bolted on, so no clumsy adapters are needed, and they fit standard Kyosho tire sizes and other 1.9-inch tires.

Part no.: KYOC6313

Price: \$7.30

tires and paint the body. Painting the body is very easy because you only have to tape the windows; the rest of the striping is done with the supplied decals. When the body is finished, you can drop it onto the chassis and do some dirt-burning!

PERFORMANCE

The Raider responded well to the controls. This was partly because of its superior, entry-level suspension design. The upper control arms keep the camber angle consistent throughout the suspen-

sion movement's range. This, along with its suspension geometry, helps the Raider to go to the head of its entry-level pack. (The stock Raider, however, isn't blindingly superior.)

One of the key elements of a top-notch car is adjustability. The Raider can be upgraded and tailored to particular tracks, or even to differing conditions on the same track. With the Raider's versatile design, Kyosho has bridged the gap between entry-level and bumper-to-bumper modified competition. Before the Raider, a racer would

have bought a second car, or fine-tuned his driving skills to overcome his entry-level car's design flaws in order to graduate to a higher competition level.

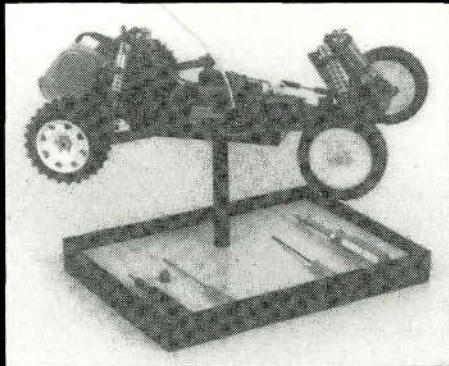
Since I haven't yet attached any of the accessories to the Raider, I can only speculate on how it will perform when the changes are made, but I think that this will be a car to look out for!

**Here are the addresses of the companies featured in this article:*

Kyosho/Great Planes, P.O. Box 4021, Champaign, IL 61820.

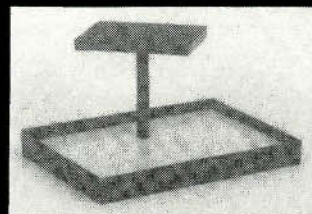
MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

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(Continued from page 102)

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(Continued on page 132)

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This new entrant into the fast, electric, deep-vee foray offers some interesting innovations.

M R C

Nordic

DEEP-VEE TURBO

WHAT MAKES a new entry into the R/C boat market successful? Ask the people at MRC*—they know what it takes. Of course, it helps that MRC put electric R/C cars on the map with the Tamiya line and that all of its land-based electric experience crosses over nicely into the world of fast electric boats. It also helps if the new design is of a popular hull configuration, e.g., a deep vee, and that the new release has an identity that performance boat lovers will recognize. MRC has blended these ingredients, added a splash of water and created the Nordic Deep-Vee Turbo.

THE KIT

The Nordic kit consists of a variety of nicely produced parts, molded, or otherwise made of plastic or metal. There isn't a stick of wood to be found anywhere in the kit, so if you're into rigging and finishing, you'll have to look elsewhere. The hull and the hatch cover are the largest pieces, and



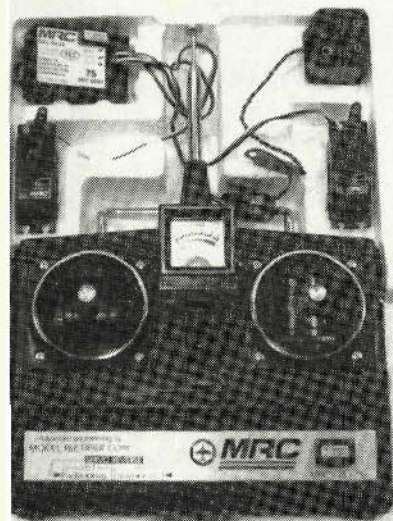
Let's take a quick look at the full-scale version of the Nordic 32—the boat on which MRC's Nordic fast electric is based. From the outside, it looks positively awesome. There isn't a disturbing line anywhere! Its paint scheme is ultra-hot, and its interior brings new meaning to the word "plush."

The Nordic folks in Lake Havasu, AZ, have really done their homework. The only thing that's understated is the single, yellow, printed sheet that I received as part of my information pack—it was the order blank! With the price closing in on six figures, I was expecting

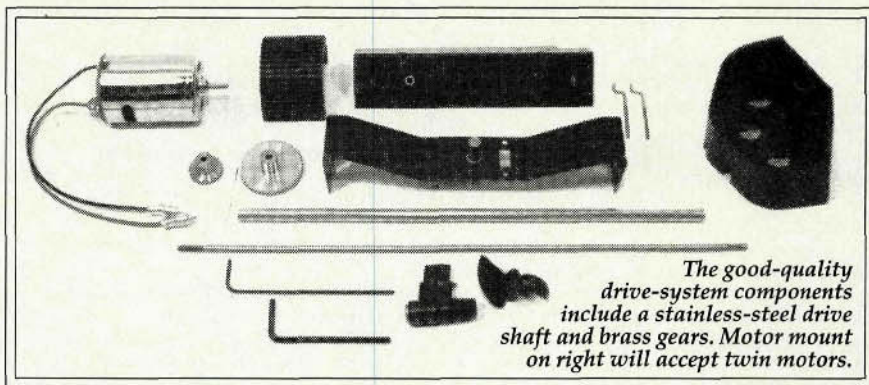
ey're vacu-formed of what appears to be high-impact polystyrene.

The hull consists of two pre-joined parts; the inner portion houses all the drive components and the radio equipment, and the outer portion forms the hull's exterior. Typical of current deep-vee philosophy, the hull is step-straked for stability along most of its 29-inch length.

The kit's remaining parts are logically bagged and easy to identify. I was a little disappointed with the 16-page instruction manual; it wasn't as



The 2-channel radio system used in the Nordic is also from MRC. Package contains everything necessary, except 12AA dry batteries.



The good-quality drive-system components include a stainless-steel drive shaft and brass gears. Motor mount on right will accept twin motors.

clear as the others I've seen. The illustrations for the Nordic are more cartoon-like than detailed, but they're adequate for assembling the kit. This is one case where good photographs would have been more helpful than some of the drawings.

ASSEMBLY

To ensure alignment, connect the drive-train components, disconnect them and then remove them. While this trial-fitting takes time, care taken here to ensure that everything is turning freely will help you avoid problems later. The setscrews for the brass gears that fit into the drive shaft and the motor are difficult to reach within the motor mount. Since a supplemental instruction sheet advises you that "a smoother-operating drive train" will result if you turn the gears around so

that their hubs face outwards, you should position them that way during the initial assembly. The drive-train installation went smoothly. The Nordic uses an underwater drive system, in which power from the motor is transmitted directly to a straight drive shaft that has the drive gear on one end and the prop at the other. There's no articulated universal joint like that found on surface-drive

SPECIFICATIONS

Type: Electric deep-vee

Length: 29¹/₄ inches

Beam: 7¹/₂ inches

Weight: 3 pounds, 2 ounces, ready to run

Hull Material: Vacu-formed, white ABS plastic

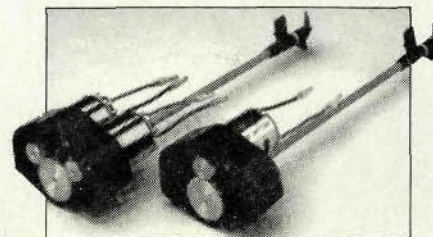
Power Req'd: 540-type motor (supplied) and 7.2V battery pack. Provision is made for an additional motor. Harness supplied is pre-wired to accept second pack.

No. of Channels Req'd: 2 (throttle and steering)

Sug. Retail Price: \$129.98

Features: Pre-joined, vacu-formed, high-impact ABS hull, stainless-steel drive shaft, machined-brass drive gears for 1.9:1 reduction system, colorful self-adhesive Mylar decal sheet.

Comments: The MRC Nordic is a good example of a well-designed boat with an uncomplicated underwater drive system that delivers good performance. To enhance performance, you can add another 540 motor. There are some problems, but they're easily remedied.



Drive system on right is a stock, single motor unit supplied with the kit. The same housing is used for dual motor installation.

units, so precise alignment of the drive components is very important if the available performance potential is to be realized. To ensure a proper fit, file either the rudder-control arm or the shaft.

(Continued on page 210)

SMOKE ON THE WATER

it to be printed on parchment!

The "32" was introduced in 1988, and it's now available with several power options, e.g., twin Mercruiser 454 Magnums that will get you up to 69mph in a flash. To increase this figure by 20mph, you can add twin PFM turbos and beat the rest of the high-rollers back to the channel at the end of the day. That kind of performance is particularly impressive when you consider that this beast tips the scales at just under 4 tons! It sounds great, but my wallet won't tolerate that kind of dent. Guess I'll call MRC and thank them for their version!

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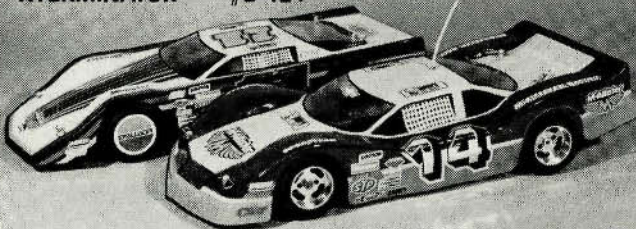
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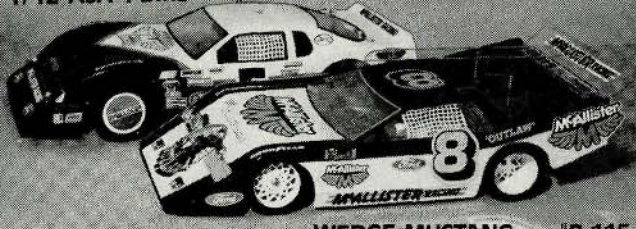
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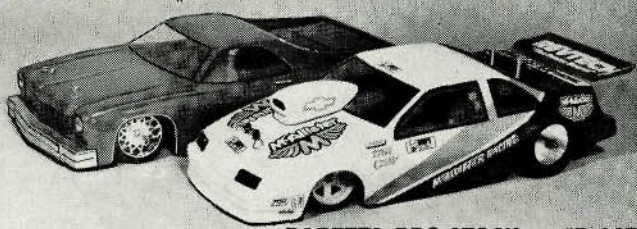
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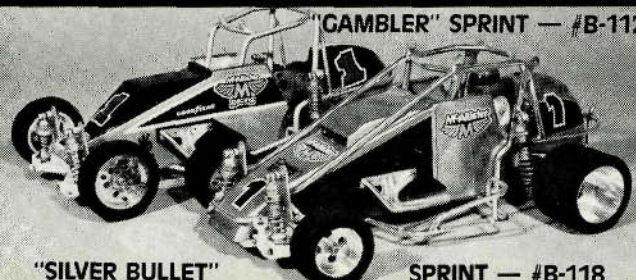


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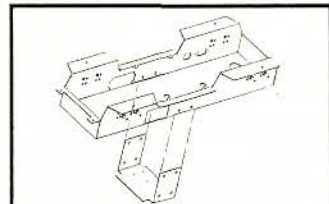
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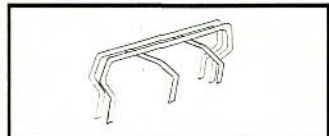
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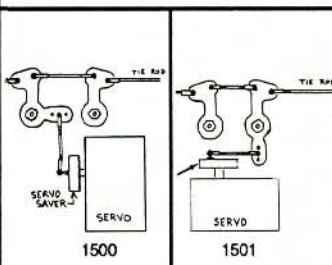


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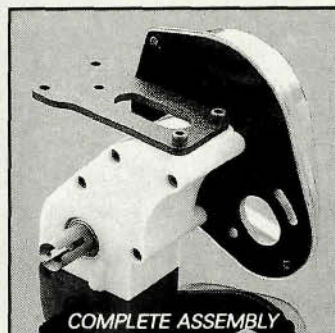
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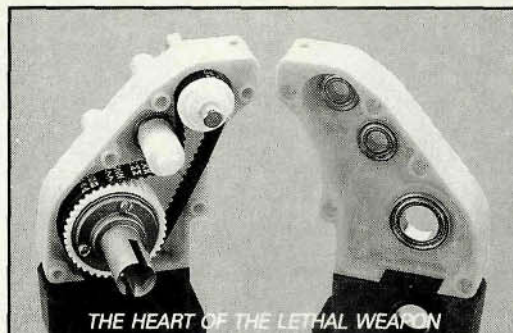
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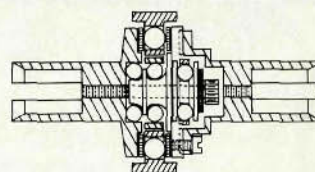
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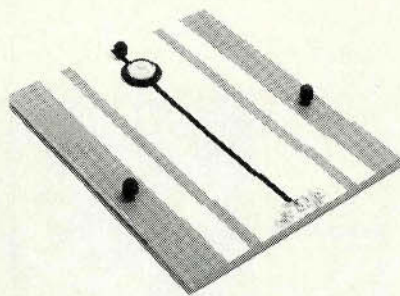
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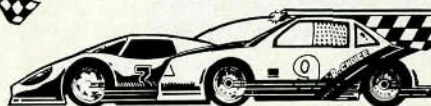
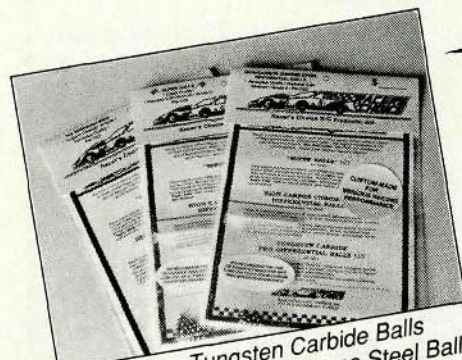
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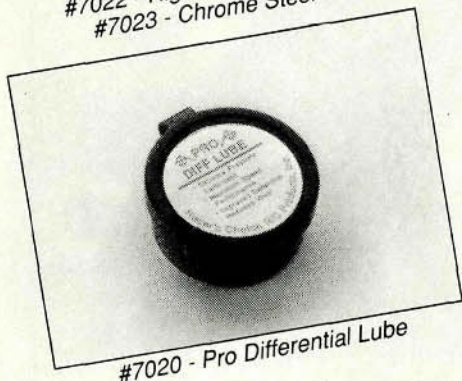
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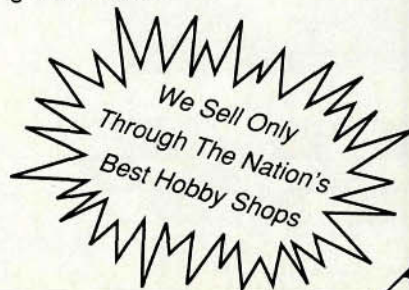
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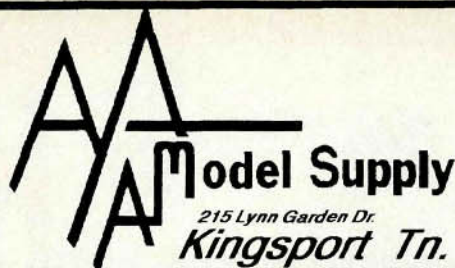
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(Continued on page 157)

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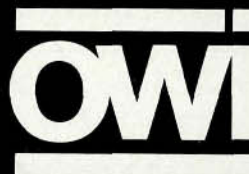


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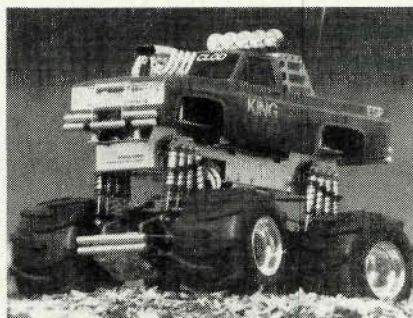
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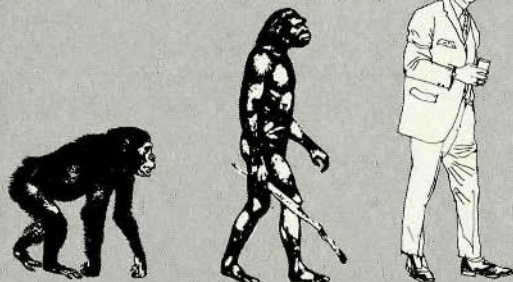
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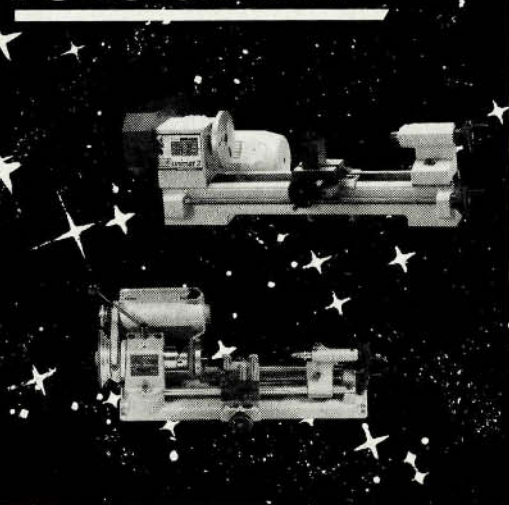
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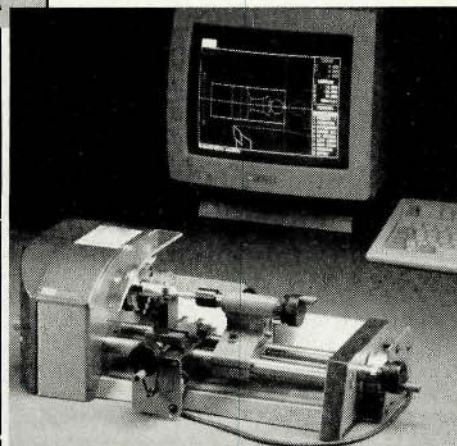
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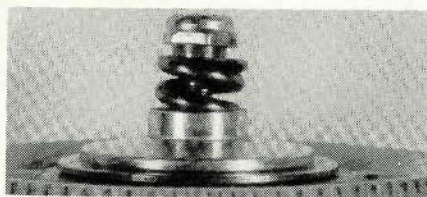
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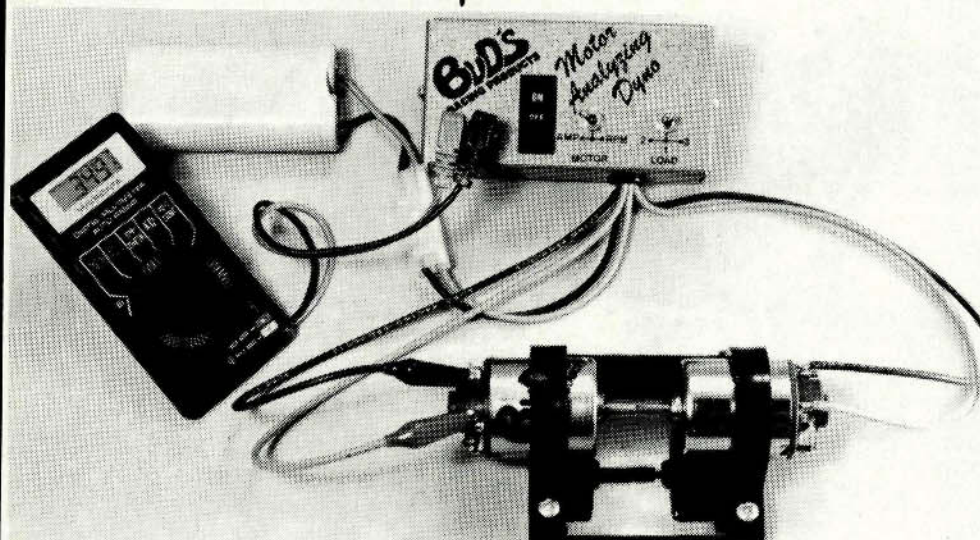
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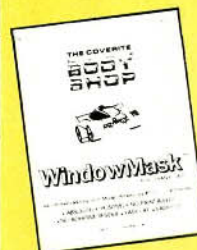
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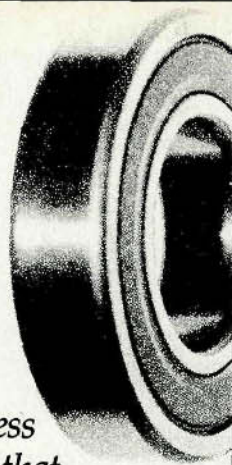
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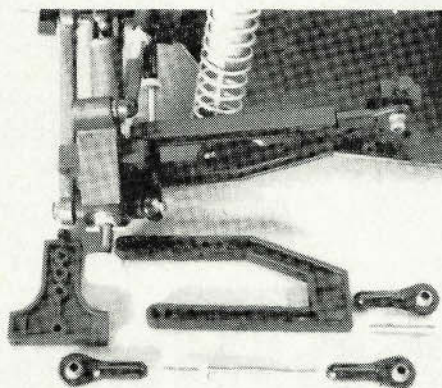
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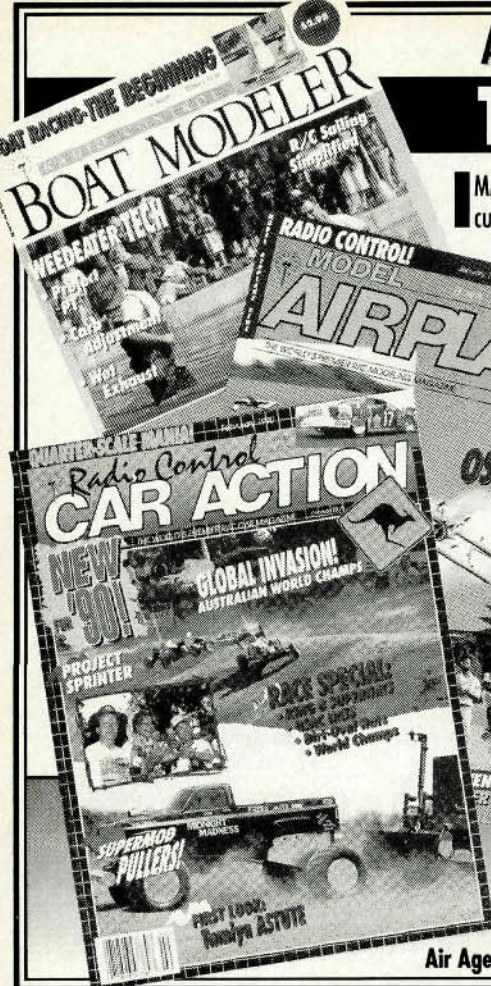
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TRACK DIRECTORY

(Continued from page 177)

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(517) 7777-USA

YMCA R/C RACERS
315 W. Main St., Niles, 49120
Paul Cooper (616) 683-1552
or Ric Clingaman (616) 683-3075

FLINT R/C CAR CLUB
Ralph Herndon (313) 658-5390
or Tom Hoos (313) 658-1043

TAIT'S HOBBIES & RACEWAY
3270 Bay Rd., Saginaw, 48603
Ron DeLorme/Don Tait (517) 799-3900

MASON COUNTY R/C CAR TRACK
Mason County Fairgrounds, Ludington
Tom Allard (601) 845-8553 or (601) 843-4837

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(612) 687-9511

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Ronny Barnes (601) 286-6161

TEAM RACE R/C CLUB
505 Spring Ridge Rd., Clinton, 39056
Thomas Bullock (601) 924-3341

NORM'S RACEWAY
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Norman Redo (601) 863-0524

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Bob Forsee (314) 443-0153

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(816) 233-4450

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10901-D Hickman Mills Dr., Kansas City, 64137
David Kinton (816) 763-9725

HOBBY VILLAGE AND RACEWAY
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Riverside, 64150 (816) 587-6435

CUSTOM R/C RACEWAY
12019 E. 47th St., Kansas City 64133
(816) 358-0238

MID-SOUTH SCALE AUTO RACING ASSOC.
Contact: Semo Hobbies, Cape Girardeau
(314) 334-4686 or (314) 887-6958

MONTANA

MIRACLE SPEEDWAY
300 Pheasant Dr., Kalispell 59901
(406) 756-RACE

(Continued on page 181)

TRACK DIRECTORY

(Continued from page 178)

NEBRASKA

ON-ROAD

7402 Plum Dale Rd., LaVista, 68128
Doc Holiday, V.P. (402) 339-7537

HOBBYTOWN RACEWAY

Sutter Place Mall, 5221 South 48th St.,
Lincoln 68505
(402) 464-2858

HOBBYTOWN RACEWAY

Rockbrook Village, 11011 Elm Street, Omaha, 68144
(402) 391-5669

HOBBYTOWN RACEWAY

Conestoga Mall, 3404 S. 13th St., Grand Island, 68803
(308) 382-3451

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3132 S. Highland, Las Vegas, 89109
(702) 732-0022

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Winchester, 03470
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(Continued on page 186)

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Parma International, an industry leader in radio control accessories and slot cars, now brings back this classic; the 1/10 scale Hemi Motor Kit.

Features include full bell housing, blower, many chrome parts, optional display stand, optional removable heads and valve covers. Easy to follow instructions make assembly a snap! Available now at fine hobby shops everywhere.



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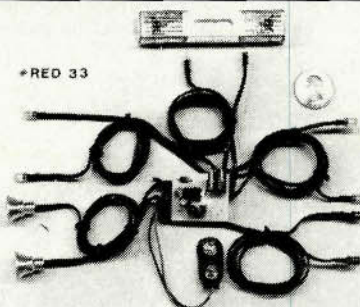
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#RED 33 \$49.95

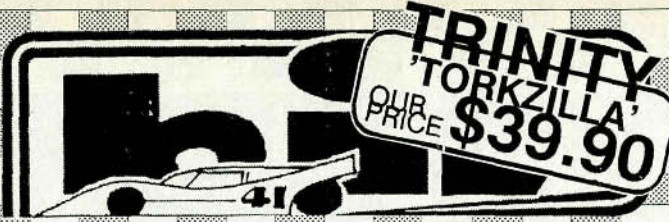


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TRACK DIRECTORY

(Continued from page 181)

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(505) 524-8530

TUNE IN NEXT MONTH FOR MORE TRACK DIRECTORY

JG YZ-10 CONVERSION

(Continued from page 73)

wheel was sheared off! The accident caused the CRM front knuckle to lose the pushnuts into which the kingpins are screwed. Back in the pits, I glued the nuts back into place. (You're supposed to glue in the nuts in before you install the knuckles.) After a few quick laps, I opened the throttle on the back straight, and before I really knew what was happening, an entire wheel assembly flew through the air! The nuts had come out of the steering knuckles again. I eventually replaced the CRM steering knuckles with Andy's* nylon ones, and my problems were solved.

TEST CONCLUSIONS

This exercise in big tires and truck bodies shows that the stock Yokomo wasn't meant to be a monster truck. Even with front-end improvements, it was still weak. The truck body doesn't provide the protection that the stock body and undertray do, and dirt gets into the truck. Perhaps using both the stock body and the truck body would keep the dirt out.

(Continued on page 204)

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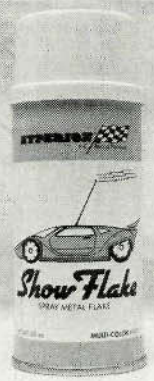
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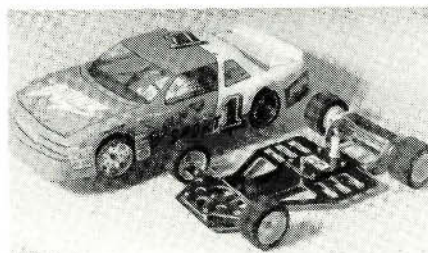
Now you can really show off with three exciting "metal-flake" finishes: silver, gold, and multi-color. Show Flake is an aerosol, it's quick and easy, no messy air-brush to clean. Just spray it on, then paint. Creates no radio interference. Be as creative as you dare!

Contact your local dealer or distributor today.



804-747-8308
Richmond, Virginia

WHAT'S NEW

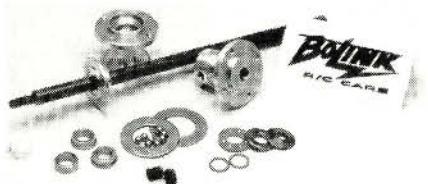


BOLINK '91 Sport

Bolink's best-selling car kit just got better! The rear suspension has been updated with a new damper system for better rear traction, so you can hang tough on the track! The aluminum motor mounts will help your motor keep its cool! All this, and a wind-cheating, stock-car body, too!

Part no. BL-1367 (no electrics); BL-1368 (with motor and speed controller).

Price: \$99.95; \$129.95.

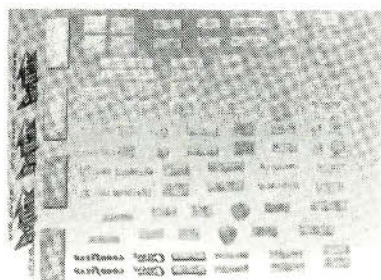


Graphite Diff Axle Kit

Bolink's Graphite Rear Diff Axle Kit includes a graphite axle, three ball bearings, aluminum hubs and all the hardware to fit your Eliminator 10, LTO and Gold Edition. This graphite diff kit can also be used to update the Sport or Invader kits.

Part no. BL-5703

Price: \$54.95



Oval Racing Sponsor Decals

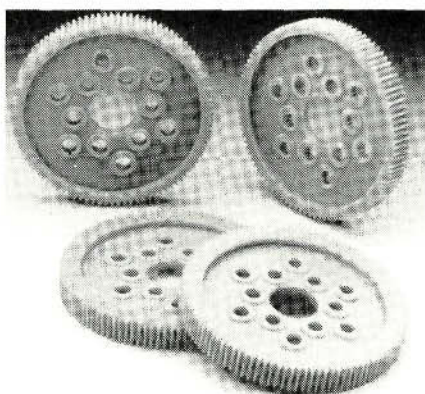
Tired of having your decals wiped out by other racers? Bolink has put a "twist" into its oval-racing sponsor

decals. They're printed in reverse, so they can be applied to the inside of your car's body (before painting). This way, the body takes the hits—not your decals!

Part no. BL 2623-R

Price: \$5.95

For more information, contact Bolink R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.



PARAGON RACING PRODUCTS 64-Pitch Spur Gears

Do you ever wish that you had a spur gear with one or more teeth up or down to get an exact gear ratio? Now it's possible with Paragon's new 97-, 99-, 105- and 107-tooth spur gears. Made from a tough nylon alloy, these gears are wear-resistant and maintain excellent concentricity. Additional odd sizes will be available soon.

Part no. SG097, SG099, SG405 and SG107

Price: \$5 each



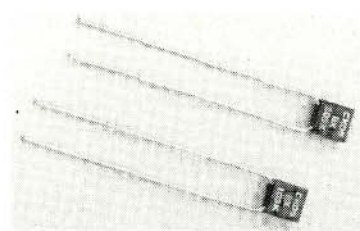
FXII Traction Compound

Paragon's new FXII Tire Traction Compound offers a positive, consistent feel from start to finish. It has all the

desirable traction characteristics of Paragon's popular Ground Effects product, but it has more bite and a less noticeable smell. The FXII works well on carpet, asphalt, concrete and dirt ovals.

Part no. FX113

Price: \$6.50



Paragon Capacitors

Paragon offers premium-grade, military-spec capacitors as standard equipment with its Modified, Pro Stock and Eclipse Series motors. These molded capacitors have the broadest frequency-stability bands and the highest anti-glitch characteristics of any in the industry. They're also available separately with a bipolar, aluminum electrolytic.

Part no. 8000

Price: \$3 (kit)

For more information, contact Paragon Racing Products, Dept. CA2, 690 Industrial Circle South, Shakopee, MN 55379.



KYOSHO Outlaw Ultima Racing Truck

Kyosho announces the Outlaw Ultima racing truck. Based on the Ultima II design, it comes with four long shocks (with Kyosho's new adjustable collars), Duraluminum shock towers, lightweight wheels and pin-spike tires with removable Lexan dirt shields.

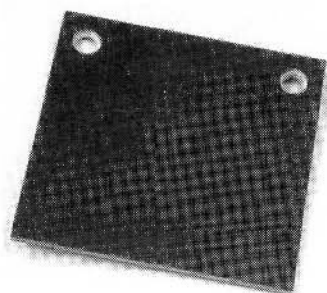


McLaren Honda MP4/5B

For authentic Formula 1 racing in electric 1/10-scale, Kyosho announces its McLaren Honda MP4/5B. The included speed controller has three forward speeds and one reverse. An electric motor is also included.

Price: \$199.95

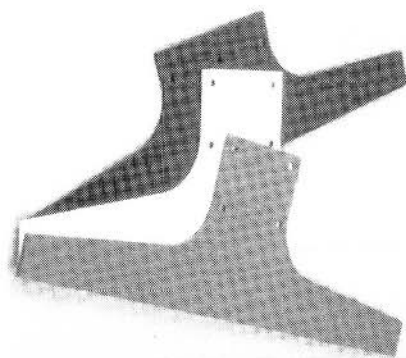
For more information, contact Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.



J-CAR Receiver Tray

Many customers buy a pan chassis but have larger receivers and speed controllers, so there's never enough room to fit everything. This J-Car tray provides the extra room you need.

Price: \$4

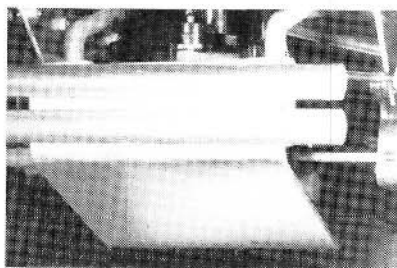


Bumpers

J-Car bumpers are extra wide for maximum protection and strength. They're made of Kydex, come in four colors (black, white, blue and red) and fit the RC10, Ultima, Raider and JR-X2.

Price: \$7.95

For more information, contact J-Car, 52 Perkins Ave., Norwich, CT 06360.

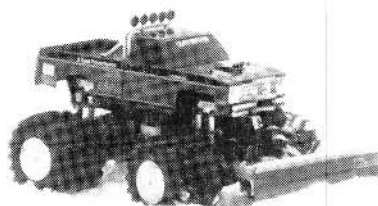


ESP King Clod Aluminum Skid Plate

For use with the ESP lower bumper, this new aluminum skid plate provides great gear-case protection.

Part no. ESP018

Price: \$10.95

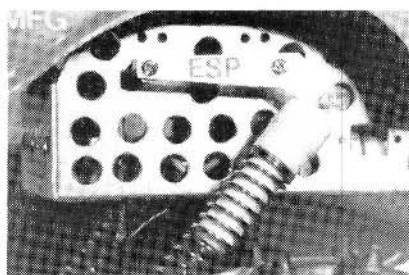


Blizzard Buster Snow Plow Kit

ESP Manufacturing introduces its Clod Buster snowplow kit, which uses a servo-operated, 14-inch blade; a quickly detachable mount; and a replacement wear bar. It can be used with a multi-channel setup, or teamed with a dual-servo extension harness and a standard servo for 2-channel systems.

Part no. ESP015

Price: \$69.95



Clodzilla Racing Suspension Kit

ESP's new racing suspension kit has special upper and lower shock-mounting brackets that relocate the shock absorbers for a more progressive action. Designed for use with four stock

or oil shocks, the kit works well with the MRC long yellow dampers (part no. MRC5304).

Part no. ESP008

Price: \$19.95

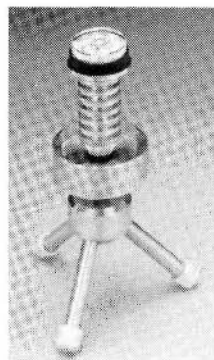
For more information, contact ESP Manufacturing, 524 Woodland Dr., Crystal Lake, IL 60014.



CUSTOM R/C PULLERS Custom Pulling Hitches

These high-quality R/C pulling hitches are computer machined from 6061 aluminum. They're available for the Blackfoot, the Big Brute, the Double Dare and the Big Boss (\$25), or the Clod Buster (\$45). Also available are the weights and weight bars for Clod Busters. Custom R/C Pullers also makes custom-built Open I and Open II pulling trucks.

For more information, contact Custom R/C Pullers, 20 Dobson Rd., Mars, PA 16046.



DEGREE ENGINEERING 1/4-Scale Bubble Balancer

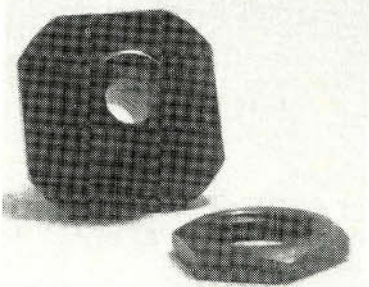
Degree Engineering introduces the 1/4-scale Tire Bubble Balancer. It has an all-metal construction and is racetrack-proven.

Price: \$79.95 (plus shipping and handling).

For more information, contact Degree Engineering, 1020 Bartlett Dr., Vista, CA 92085.

(Continued on page 194)

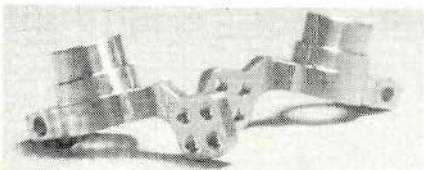
WHAT'S NEW



TRINITY YZ-10 Quick Change Hubs

Tired of losing wheel screws in the pits? These purple, anodized-aluminum hubs hold the wheels on with nuts for quick removal, and this makes wheel changes a breeze!

Part no. MM502
Price: \$32.99 (4 pieces)

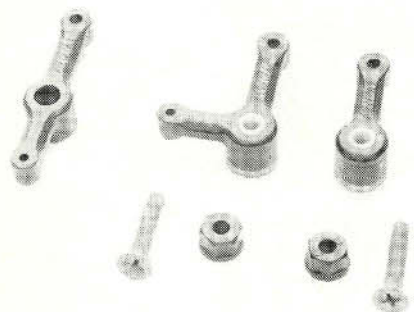


YZ-10 Rear Hub Carrier

These superstrong, aluminum, rear-hub carriers are precision machined for better bearing alignment. The four upper link-mounting holes offer more adjustability.

Part no. MM506
Price: \$39.99

For more information, contact Trinity, 1901 East Linden Ave. #8, Linden, NJ 07036.

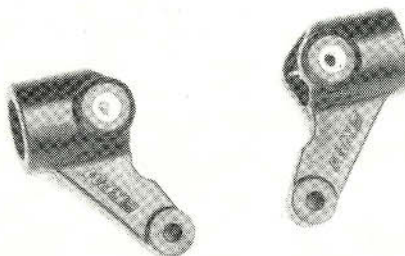


RPM JR-X2 Heavy-Duty Bellcrank Set

RPM now makes a heavy-duty bellcrank that's specially designed for the JR-X2 and JR-XT. It removes the flexing in the bellcrank that was origi-

nally used as a "servo-saver." The bellcrank comes with both stock 90-degree and "in-line" pivots, and this gives you four servo-mounting options. It's lightweight and works very smoothly.

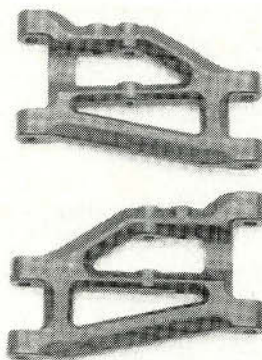
Part no. 7302
Price: \$12.95



Yokomo Nylon Front Carriers

RPM now makes front-bearing carriers for the Yokomo YZ-10. They're unique because they have small, aluminum, threaded inserts (which are injection-molded right into the carriers) for the kingpins. These inserts let you tighten the kingpins better than in the magnesium inserts. The bearings fit snugly into the nylon and are perfectly aligned. They're also 30 percent lighter than stock!

Part no. 7510
Price: \$8.95/pair



RC10 Truck Wide Front Arms

RPM now makes extra-wide front arms for RC10 truck conversions that are 1/4 inch wider than a regular "wide" arm. They're lightweight; designed for minimum flexing; push the front wheel width out near the maximum limit for added stability; and are of injection-

molded tough black nylon with two shock-mount positions.

Part no. 7060
Price: \$11.95

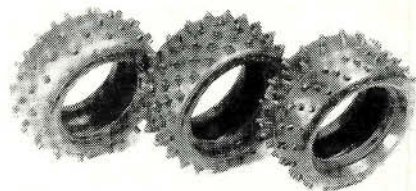
For more information contact, RPM Custom Engineered R/C Products, 14798 Sierra Bonita Ln., Chino, CA 91710.



TEAM ASSOCIATED R/C Off-Road Video

Discover "R/C Off Road"—an exciting music video that combines sports and sound! You'll see great off-road adventures with plenty of thrills and spills—all cut to a rock soundtrack that's tuned to every twist and turn! As a bonus, the experts give tips on how to make your next R/C adventure the best! (Lasts approximately 30 minutes.)

Part no. 6972
Price: \$14.95



Rear Tires for RC10 and Yokomo

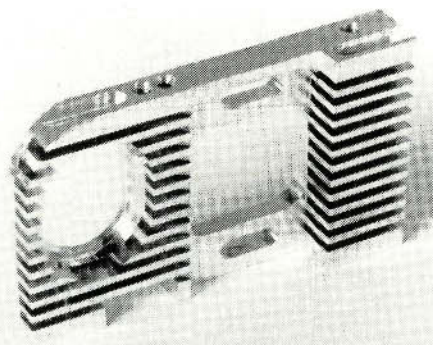
The TR8 (left) Pin Spike and the TR9 (center) Pyramid Spike tires fit 2-inch-diameter wheels. The TR12 (right) Directional Cut Spike tire can be reversed to increase or decrease traction on hard, packed surfaces.

Price: \$11/pair

For more information, contact Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

(Continued on page 196)

WHAT'S NEW



TEAM ASSOCIATED Right-Hand Aluminum Bulkhead

Associated's new, aluminum motor mount will keep your RC10L or RC12L motors cooler than ever, thanks to their specially machined, heat-sink fins.

Part no. 4354

Price: \$25

For more information, contact Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

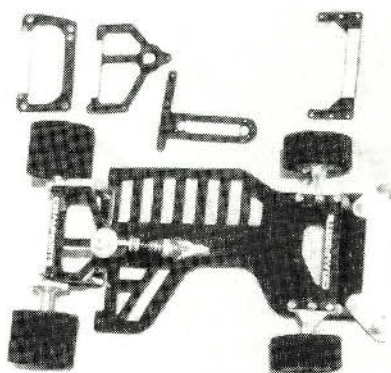


BADGER AIR-BRUSH CO. Propel Propellant

Badger Air-Brush Co. has introduced its new, environmentally safe Propel Propellant line for spray painting. The new formula doesn't contain any of the CFCs believed to damage the ozone layer.

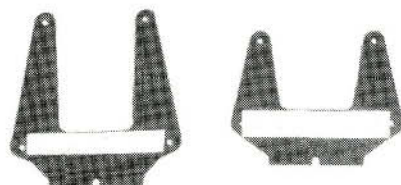
Price: Regular, \$7.95; Economy, \$9.95.

For more information, contact Badger Air-Brush Co., 9128 W. Belmont Ave., Franklin Park, IL 60131.



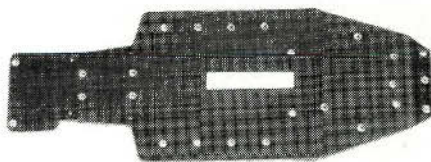
COMPOSITECRAFT Associated 10L Upgrades

New from CompositeCraft, these Associated 10L upgrades are made of very strong graphite for less flexing. Associated 10L Graphite Top Plate, part no. 10067 (\$10.95); 10L Bottom Plate, part no. 10066 (\$9.95); 10L Flex Plate, part no. 10068 (\$9.95).



Schumacher Cougar Upgrades

New from CompositeCraft are graphite Schumacher Cougar Front Shock Mounts. These high-quality shock mounts replace the weak stock parts. Part no. 10062 (stock) and part no. 10063 (for use with long shocks).



Cougar Graphite chassis

Announcing CompositeCraft's Schumacher Cougar Graphite chassis. This chassis is more rigid than the stock, aluminum one.

Part no. 10059

Price: \$55.95

For more information, contact CompositeCraft, 5885 Lake Hurst Dr., Orlando, FL 32819.

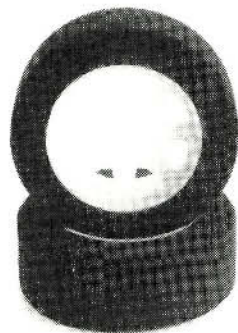


CUSTOM WORKS Custom Works T-Shirt

This shirt says it all: "Custom Works...the Dominant Force." It's made of cool cotton, in heather gray with black and bright pink screening. Sizes M, L, XL and XXL.

Order no. 1500

Price: \$15



Foam Tire Mounted on Cyclone Wheel

Custom Works introduces mounted foam tires for the Dominator. They're mounted on the new Cyclone Wheel, and they work well on smooth dirt tracks, concrete, or asphalt. They're available in yellow, green, and blue.

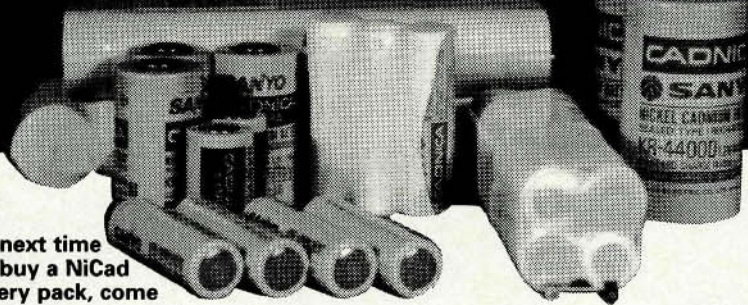
Part no. 6075

Price: \$22

For more information, contact Custom Works, 3720 Easton Dr. #7, Bakersfield, CA 93309.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by Radio Control Car Action, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in Radio Control Car Action.

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JG YZ-10 CONVERSION

(Continued from page 186)

Despite its problems, the truck gave me the most fun I've had with my Yokomo! It handled well and the new Tekin 411P surpassed all my expectations. If you have the time, this is one conversion that you have to try!

*Here are the addresses of the companies mentioned in this article:

Yokomo; distributed by **Associated Electrics**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

J.G. Manufacturing, P.O. Box 6014, Whittier, CA 90609.

RPM, 14978 Sierra Bonita Ln., Chino, CA 91710.
Jammin' Jay Halsey/Team Losi, 1655 E. Mission Blvd., Pomona, CA 91766.

Magic Motor Sports; a subsidiary of **Trinity Products**, 1901 E. Linden Ave., #8, Linden, NJ 07036.

Associated Electrics, see above.

SRM Company, Suite 833, Fox Pavillion, Jenkintown, PA 19046.

CRM Racing, Inc., 36099 Cathedral Canyon Dr., Cathedral City, CA 92234.

Airtronics, Inc., 11 Autry, Irvine, CA 92718.

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.

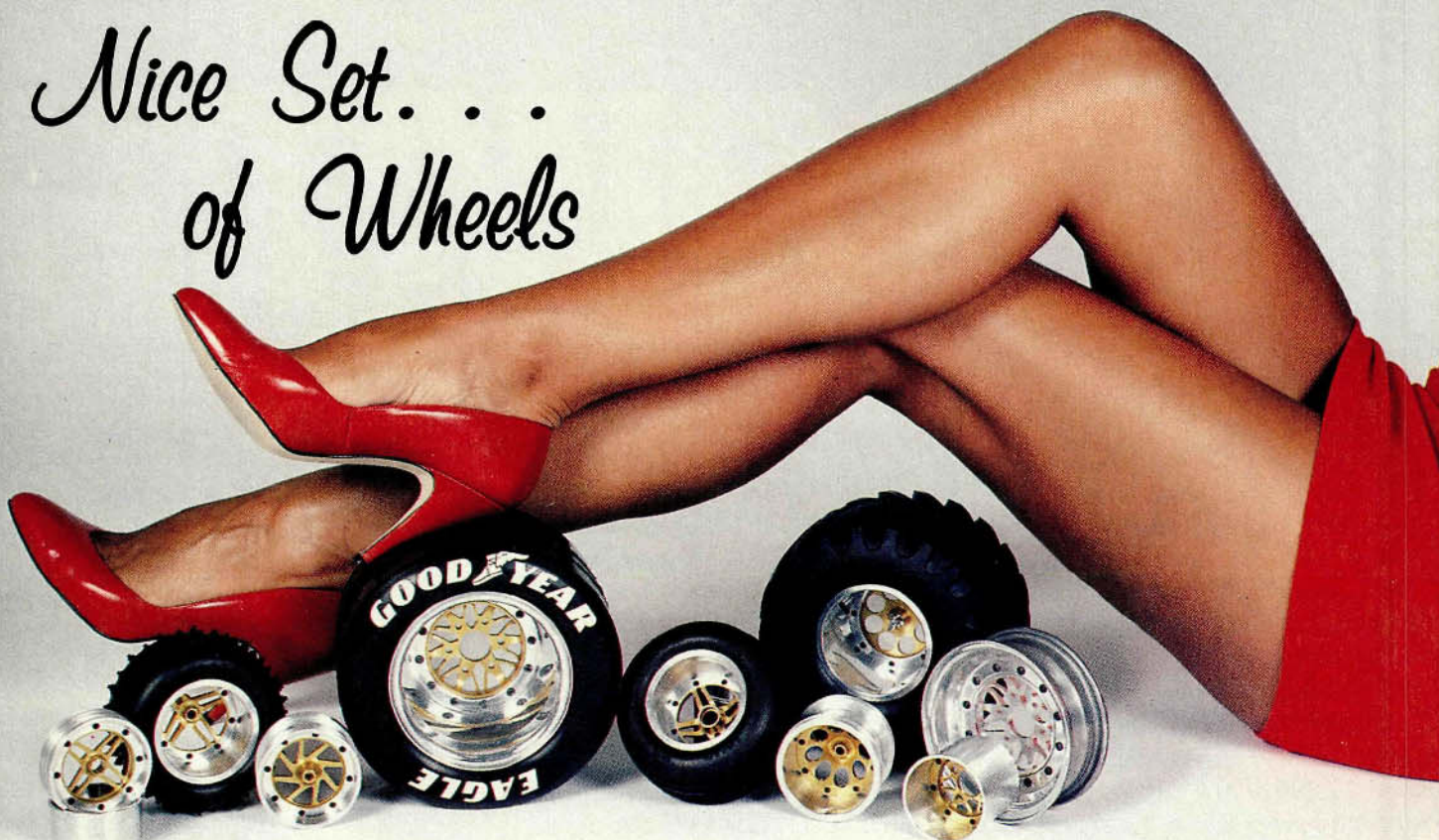
B&R, Motorworks, 28000 Tothill Dr., Santa Clarita, CA 91350.

Bullet Enterprises, P.O. Box 322, Shoemakersville, PA 19555.

Pactra Plasti Kote Co., 1000 Lake Rd., Medina, OH 44256.

Andy's R/C Products, 466 West Arrow Hwy., Unit K, San Dimas, CA 91733.

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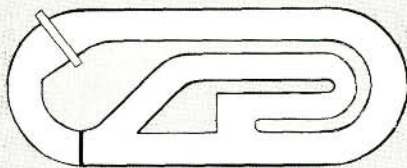
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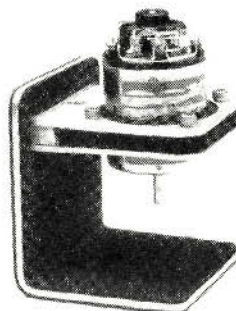
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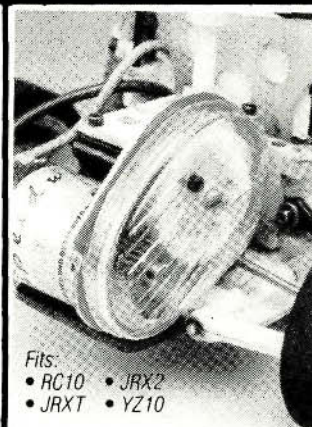
You already know that we've got your parts. Now, Island Hobbies & Raceway is proud to introduce two new products. The RC10 "Dust Cover", made of strong lexan, seals out dirt, dust & water & snaps tightly in place without using body clips. **Price: \$6.95.** The "Motor Vise" is made of strong aluminum & holds your motor in place without screws or clamps which can damage the can, allowing hands-free operation while working on your motor. **Price: \$14.95.**

MOTOR VISE



PRICE: \$14.95

RC10 DUST COVER



Fits:

- RC10 • JRX2
- JRXT • YZ10

PRICE: \$6.95

MRC NORDIC

(Continued from page 131)

One of the hull's unique features is the incorporation of embedded brass-screw receptacles that allow brackets for the speed controller and the switch mount to be securely attached to the hull. This en-

sures accurate positioning of the components.

The speed controller is a typical electro-mechanical unit that consists of a wire-wound resistor with a servo-driven wiper. It provides variable forward-and-reverse speed control, and it's pre-wired for connecting the motor and the two battery

packs, which will provide a longer running time. For thrill-seekers, a second 540 motor and gear may be added, and this is easily bolted onto the existing gearbox. I completed my Nordic in the stock, single-motor, single-battery configuration.

(Continued on page 212)



Killer Cab

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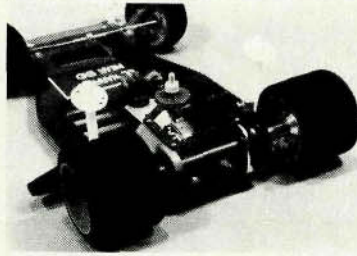
SEE 2200 holes/front
2210 holes/rear
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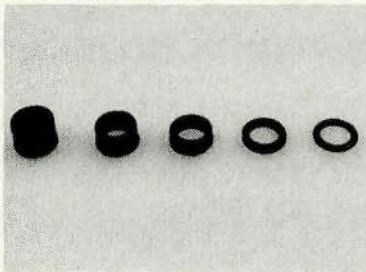
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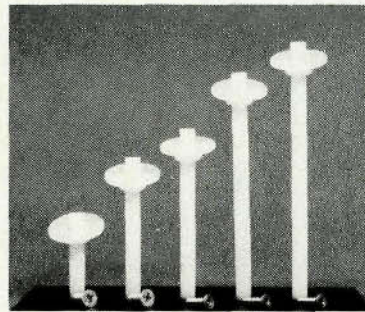
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REAR AXLE SPACERS

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MRC NORDIC

(Continued from page 210)

RADIO INSTALLATION

I chose a 2-channel, two-stick MRC 2S-27 radio, which consists of a receiver, a transmitter, two servos, a dry battery pack and a switch harness. This is a great unit, and it's all that you'll need for the Nordic. Mine did prior duty in my Tamiya Lunchbox car, so I was confident about its performance.

The recommended method for installing the hatch called for a single brass thumbscrew to go into a threaded fitting located on the switch-mounting bracket. Velcro strips were supposed to be placed around the hull's inside perimeter with corresponding pieces attached to the hatch itself. This didn't work too well because the Velcro prevented the hatch from fitting flush with the hull. I removed it and devised another method. I made four, small, teardrop-shaped plates of 1/16-inch plywood that I bonded to the fixed part of the hull so that they'd capture the leading edge of the hatch when it was slid into place. I installed the thumbscrew, and the result is a hatch that fits properly and looks great.

FINISHING

Now, it was dress-up time. First, I painted the hatch interior so that it wouldn't look so sterile. I used flat black for the seats and the dashboard area behind the windshield and gloss red for my little "teardrop" hatch retainers.

I removed the protective film from the windshield, cut slots in the hatch to match the ears and mounted it with CA. I wiped the hull with alcohol, applied the decals (which I cut from the large sheet) and positioned them as shown in the drawing and on the box cover. After I had added the chrome-plated detail parts, e.g., handrails, vents and exhaust pipes, I was ready to launch.

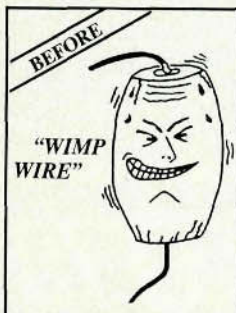
I followed the recommended break-in procedure, even though I balked a little when the instructions told me to "remove the drive-train components from the boat, clean the components, re-apply lubricant and reinstall them."

PERFORMANCE

I had some problems the first time out with the Nordic, but that's to be expected.

(Continued on page 216)

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MRC NORDIC

(Continued from page 212)

When it was 10 feet away from me, it seemed to have a mind of its own. The throttle was erratic, and it cycled through out the speed range with no help from me. The steering was the same way. It finally went to "off," and stayed there. I enjoyed my first swim of the summer!

I pondered the problem. I had just put fresh batteries in the transmitter and the receiver. Had I grabbed the wrong transmitter by mistake? No, but I checked it anyway. How about the location of the receiver antenna that was taped to the inside of the hull? I moved it to the fore-deck. I taped it into position, and this put the range increase back to normal levels. In the water, the Nordic got on plane right away and handled well. It took a little rudder trim so that it would track straight "hands-off," and I ran the first battery pack down just getting the feel of it.

Back on shore, I installed a new pack, but I positioned it slightly forward to get the bow down. Because of the solid drive system and absence of trim tabs, moving things around in the radio compartment is the only way to trim these boats. This time, it took a little more running to get on plane, but once there, the Nordic performed like the boats along the Miami waterways.

After two more 5 1/2-minute runs, I returned to my workshop to see what else I could fine-tune. I changed the antenna installation to the more conventional vertical arrangement by running the antenna inside a nylon tube. The switch location was bad because it penetrated the hatch at a location where it acted like a sump. Any water entering the cockpit was almost sure to find its way to the switch. I removed the switch from its mounting-bracket location to the hatch, and there was still enough wire to allow hatch removal.

I thoroughly enjoyed assembling and running the Nordic. My log shows I've run 20 packs through it, and so far, it hasn't required any maintenance. I think it's ready for tear-down pretty soon. Perhaps I'll install a couple of hot racing winds and that extra pack—bring on Miss Budweiser and some chop!

**Here's the address of the company featured in this article:*

MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

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